2024 Community Survey

Detailed Report of Findings

May, 2024

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Objectives & Methodology

OBJECTIVES

The research is designed to provide an in-depth understanding of the FreeBSD user community:

- Profile FreeBSD users based on key technical/user criteria and demographics
- Understand the user journey
- Gauge awareness & understanding of the Foundation and its offerings
- Identify strengths and weaknesses for the Project and Foundation
- Understand differences between key subgroups

The information will be used to develop strategies to increase engagement and improve the FreeBSD user experience.

METHODOLOGY

- An **anonymous online survey** administered by FreeBSD among members of the FreeBSD Research Community.
- Respondents were recruited through a variety of means including: email, social media, FreeBSD Discord, Reddit, Hacker News and other media.
- The survey included more than 50 closed- and open-ended questions.
- FreeBSD was identified as the research sponsor. No incentive was used to reward respondents.
- A total of **1,446** returns were received (not all respondents answered all questions)

Technical Notes

Weighting

- Sample is not weighted and as such, represents those who completed the survey, which may or may not be representative of the entire community of FreeBSD users.

Significant Difference Notations

- With a sample size of 1,446 respondents, the maximum error range on total sample results at the 95% confidence level is +/- 2.6%. (The error range is higher when comparing subgroup scores).
- Throughout the report, statistically significant results are indicated with the following notations:

Boxes/circles: indicates score is higher/lower than one or more other subgroup score(s) at the 95% confidence level

Callout boxes:

Nomenclature

In the questionnaire, we used the terms “professional” and “hobbyist” to describe our contributors and users. However, in reviewing the results, we realized that the term “hobbyist” does not accurately represent the population we are addressing. To that end, we have chosen to adopt the terms “Corporate User” and “Individuals,” matching the nomenclature used by both BSDCan and EuroBSDCon.

NOTE: Numbers may not always total 100% due to rounding

Key Takeaways

ONE SIZE WILL NOT FIT ALL

- The community includes users from a wide range of backgrounds, experience levels, and with different needs, priorities and expectations. This means that a differentiated approach to marketing & communications will be essential for ongoing success. Among the key segments to think about that may demand different approaches are: Corporate User vs. Individuals, where FreeBSD is primarily being used, newer (<5 years) vs. long-term (15+ yrs) users, and location (Europe/NA, vs. elsewhere).

GROW THE COMMUNITY THROUGH RECRUITMENT

- The community wants and expects the Foundation to focus on recruiting new users. Social media should be main pillar of any strategy as this is where younger/newer members get their information. There seems to have been a drop off in exposure to FreeBSD via word-of-mouth referrals and through educational settings so consider programs that leverage these channels. Specific messaging will vary according to target segment, but among the most compelling benefits to highlight: FreeBSD as a complete package; Unix-like Linux alternative; simplicity, stability, ZFS, and FreeBSD's security strengths. (ZFS and security are highly important server workload attributes that also happen to be key strengths).

STEP-UP TRAINING & SUPPORT

- While not a major weakness, more could be done to improve training & support, particularly for newer users and for those outside of EU/NA. Areas needing the greatest focus are: access to peer support (big opportunity here); amount of learning resources; range of formats available (e.g, more YouTube content or tutorials), range of topics available and the ease of access to resources in general.
- Education is an area the community would like to see the Foundation focus on, and there may be an opportunity generate a revenue stream through paid professional training. Topics like Kernal Internals and FreeBSD for Linux Sysadmins may have the broadest reach, but other topics have niche appeal in certain segments (e.g, How to contribute or Intro to FreeBSD for new users; Kernel development for those in a Committer or Contributor role).

STREAMLINE DOCUMENTATION AND SUPPORTING MATERIALS

- Documentation is one of the main resources users turn to, along with man pages and forums. In open ended comments, users say that the materials are unnecessarily cumbersome due to lack of organization and too much outdated content. Focus on cleaning this up and providing a central resource on the website where users can get reliable info.

Key Takeaways (cont'd)

LTS TIMEFRAME TOLERANCE – BEWARE

- Move cautiously with any decision around reducing LTS timeframe; FreeBSD users expect major/LTS branches to be supported for 3-4 years on average – with Corporate Users and those using primarily for network appliances on the longer end of that range. Importantly, few (only 1 in 10) would pay for extended support; even in segments that might be open to the idea, *potential* willingness to pay caps at 14%.

ADDRESS HARDWARE DEFICIENCIES, PARTICULARLY AROUND WI-FI DRIVERS

- Currently fewer than half of users consider FreeBSD their daily driver; Individuals are less likely than Corporate Users to consider FreeBSD primary. The barrier seems to be less about software and more about hardware support, particularly around Wi-Fi drivers (which are at the top of the wish list for the Foundation to focus on in the coming year). A relatively high number of those who don't consider FreeBSD their main OS say they would consider doing so with hardware support for desktops and laptops that was equivalent to Linux.

DEMYSTIFY THE CONTRIBUTION PROCESS

- For those who have participated in the past 12 months, the contribution process has been mostly positive (if only moderately so); the community is welcoming, mailing list posts are mostly seen as courteous and respectful and few say they have not contributed because of a bad experience. Rather, the main barrier to contributing seems to be a lack of clarity around how to contribute (along with a lack of confidence). Newer community members and those outside of core markets both want to contribute but don't know how or whether they should. There is some appetite for paid 'how to contribute' workshops, but peer/mentors might also help, along with 'how to' tutorials.
- Improved clarity around if/when code will be reviewed may also be warranted as this is a key complaint for Committers.

WHOLE-WORLD APPROACH

- Users from Europe and North America make up the lion's share of the community; these users have been generally satisfied with their experiences. But more could be done to incorporate users from outside of these regions. Users from South America, Africa, Asia and Oceana collectively are less likely to see the community as "welcoming" and, in open-ended comments, some express a desire to "de-Americanize the project". They would like to contribute more to the project, but they are not sure how. Training & education is one area of focus where these non-dominant regions may have been underserved, with lower scores on a number of attributes including quality and ease of accessing learning resources

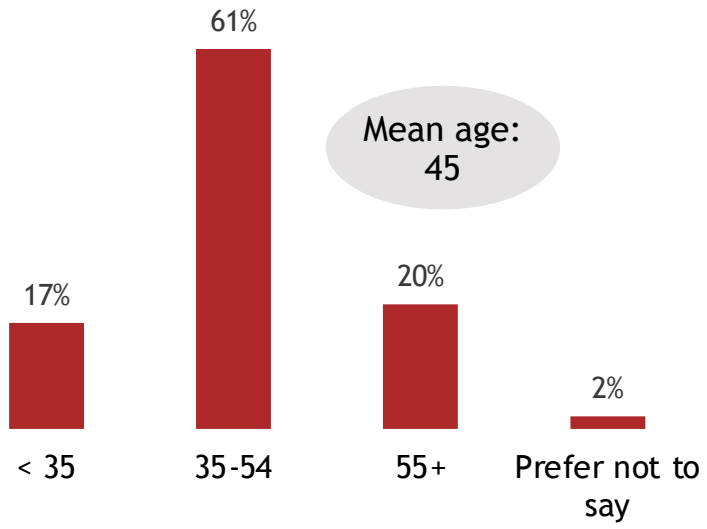
Respondent Profile

- The typical respondent is 45, located in Europe or North America; he/she uses FreeBSD daily, primarily outside of work, and has been doing so for about 13-14 years.
- Compared to Individuals, Corporate Users are older, more likely in a committer or contributor role, and have been using FreeBSD longer and on a more frequent basis.
- FreeBSD is most frequently used on Servers, especially for Corporate Users; Individuals are more likely than Corporate Users to primarily use FreeBSD on a desktop or laptop.
- Fewer than half consider FreeBSD their daily driver – although this is somewhat higher among Corporate Users. The main barrier seems to be more of a function of hardware support than of software. If desktop/laptop support was similar to that of Linux, a number of Individuals would make FreeBSD their daily driver.
- Firewalls are widely used – particularly for Corporate Users and those using primarily for Network appliances; pf is by far the most common option, with ipfw is a distant second.

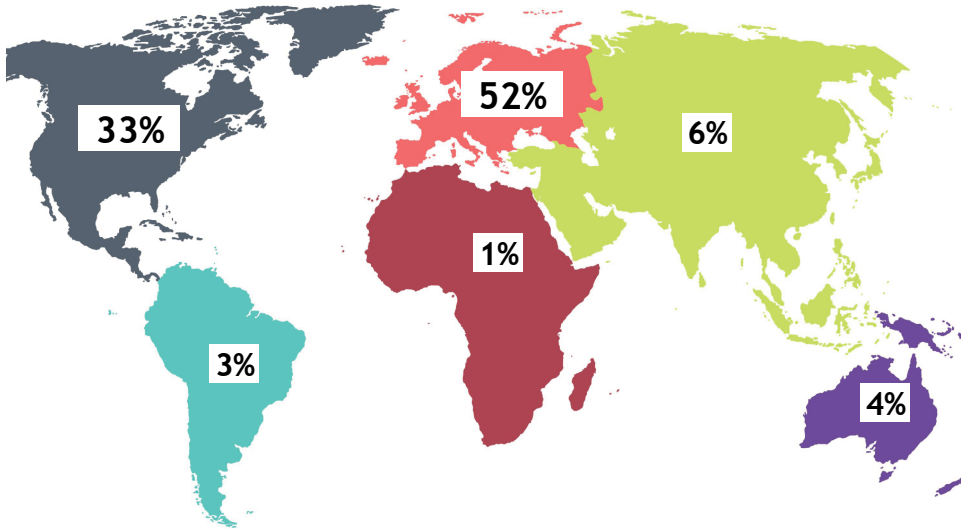
Respondent Demographics

- The typical respondent is age 45 and is located in Europe or North America.

Respondent Age
(Among All Respondents)



Where Located
(Among All Respondents)

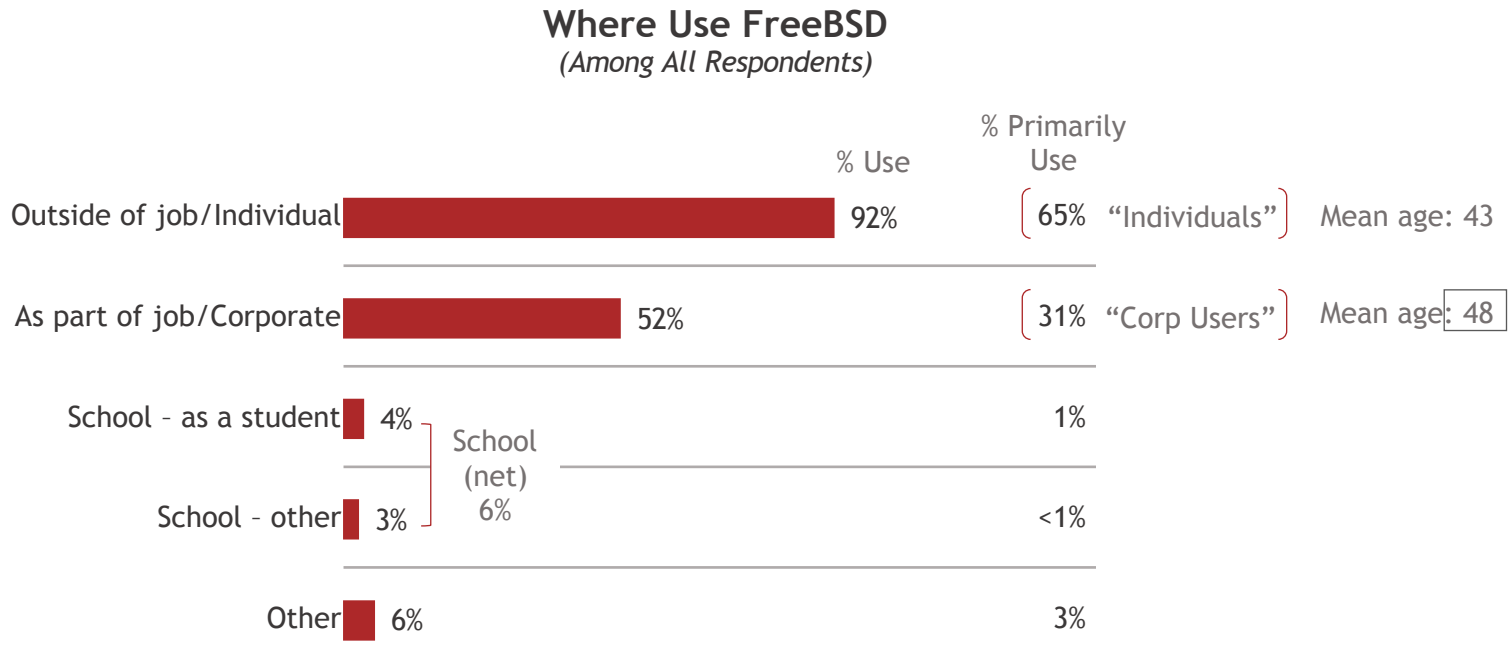


1% prefer not to say

SOURCE: Q53. What is your age?) | Q54. Where are you located?

Where Use FreeBSD

- About two in three respondents primarily use FreeBSD outside of their job. (“Individuals”)
  - About one third are primarily Corporate Users, using primarily at work. (“Corporate Users”)
  - Individuals are notably younger than Corporate Users.

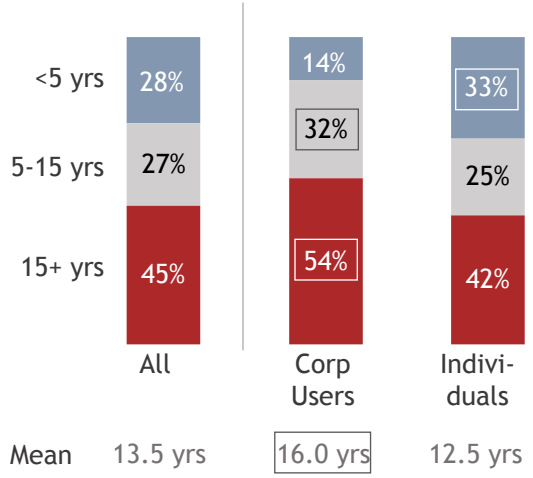


SOURCE: Q6. Do you use FreeBSD…? (check all that apply) | Q7. Do you use FreeBSD Primarily…? (check one)

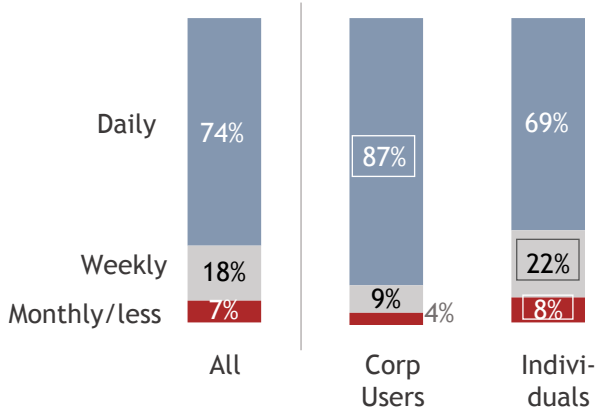
Other FreeBSD Usage Characteristics

- The typical respondent has been using FreeBSD 13+ years and uses it daily.
  - Corporate Users have been using FreeBSD longer than Individuals and use more frequently (daily vs. weekly).
  - Nearly all users – Corporate and Individual – will use 64-bit X86 architecture in the next 12 months; 64-bit ARM also somewhat popular, but others have more niche coverage.

Years Using FreeBSD
(Among All)



Frequency of Using
(Among All)



CPU Arch Will Use Next 12 Mos.
(Top Mentions, Among All)

	All	Corp Users	Indivi-duals
64-bit X86 (amd64)	97%	98%	97%
64-bit ARM (aarch64)	42%	42%	43%
32-bit ARM (armv7)	7%	10%	5%
32-bit x86 (i386)	7%	8%	6%
64-bit RISC-V (riscv 64)	7%	8%	6%
64-bit Power (powerpc64,powerpc641e)	2%	3%	2%

Esp:
- **Cloud primary** (55%)

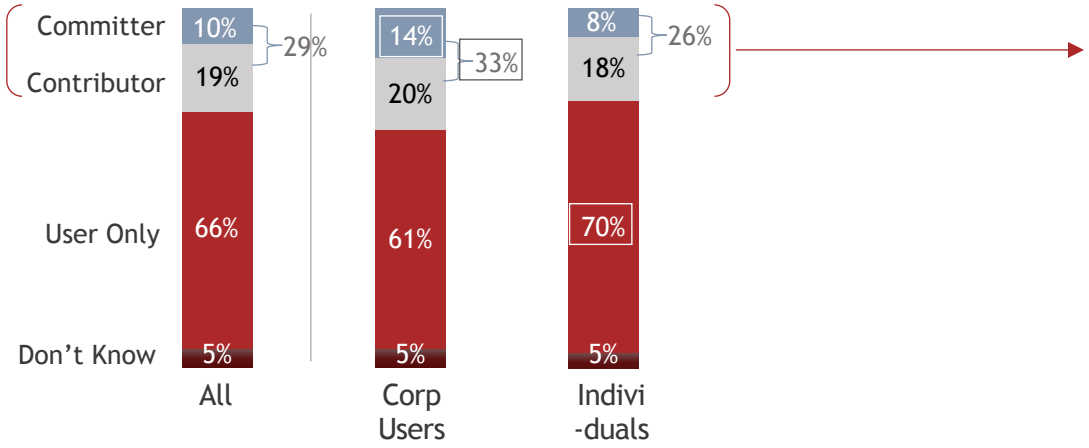
SOURCE: Q8. For about how long have you been using FreeBSD? | Q9. How often do you use FreeBSD? | Q10. Which CPU Architectures will be used in the next 12 months by you or your employer in a production capacity (e.g., server, desktop, laptop, appliance and not as the target for development) (check all that apply)

Project Role

- Most survey respondents describe their project role as user only;
  - Nearly three in ten are committers or contributors (typically with a Ports or Src focus).
  - Corporate Users are more likely than Individuals to be in a committer or contributor role.

FreeBSD Project Role

(Among All Respondents)



Part of FreeBSD Identify With Most

(Among Committers/Contributors)

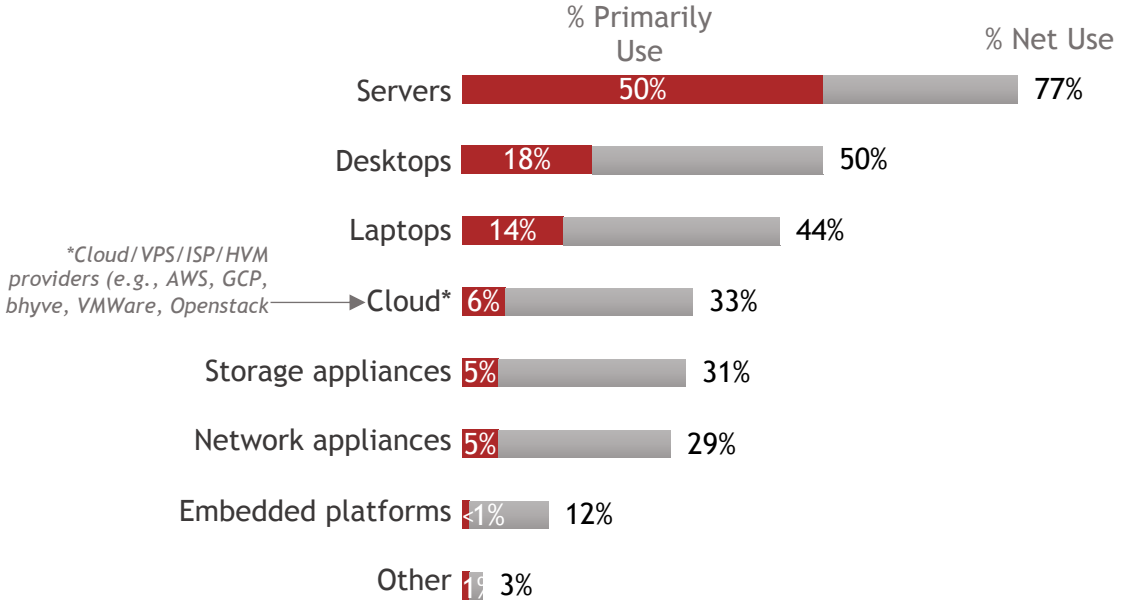
	All	Corp Users	Individuals
Ports	40%	32%	44%
Src	31%	38%	27%
Advocacy	18%	17%	18%
Doc	4%	2%	6%
Infrastructure	3%	3%	3%
Other	5%	7%	3%

SOURCE: Q45. Do you consider yourself. . .? | Q46. Which part of FreeBSD do you identify with the most? (Check one)

How Use FreeBSD

- Respondents use FreeBSD in multiple formats, with servers, desktops and laptops most common.
  - Servers are the primary use case for half of users – even more prevalent among Corporate Users.
  - Individuals also primarily use FreeBSD on servers but are more likely to use laptops or desktops.

How Use FreeBSD
(Among All Respondents)



How Primarily Use
(By User Type)

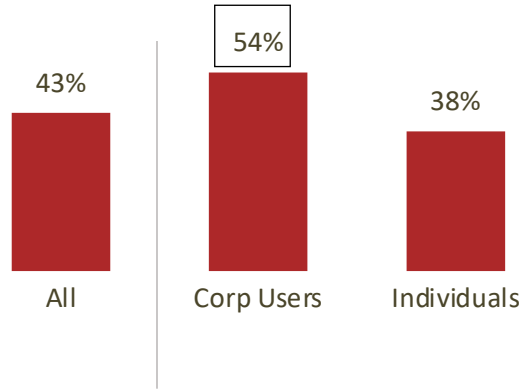
	Corp User	Individuals
Servers	61%	47%
Desktops	10%	20%
Laptops	8%	17%
Cloud*	7%	6%
Storage appliances	5%	5%
Network appliances	8%	4%
Embedded platforms	2%	<1%
Other	1%	1%

SOURCE: Q1. Do you use FreeBSD on…? (check all that apply) | Q2. Where do you primarily use FreeBSD? (check one)

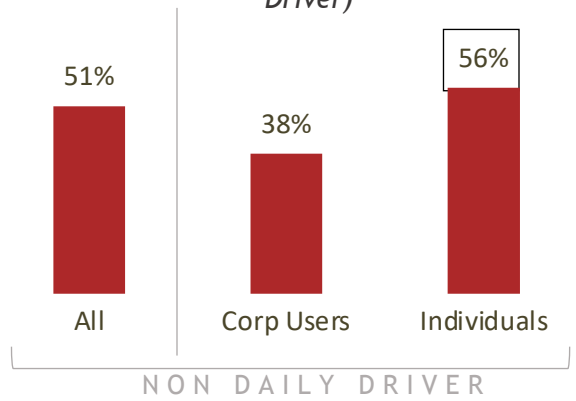
FreeBSD as Daily Driver

- Fewer than half of respondents consider FreeBSD their daily driver (or the OS they use most frequently).
  - Those primarily using FreeBSD in their job are more likely than Individuals to consider FreeBSD primary.
  - Notably, Individuals would be open to doing so if desktop/laptop support mirrored that for Linux.

Consider FreeBSD Daily Driver
(Among All Respondents)



Would Use as Daily Driver if DT/LT Support Equivalent to Linux
(Among Those Who Do Not Consider FreeBSD Daily Driver)

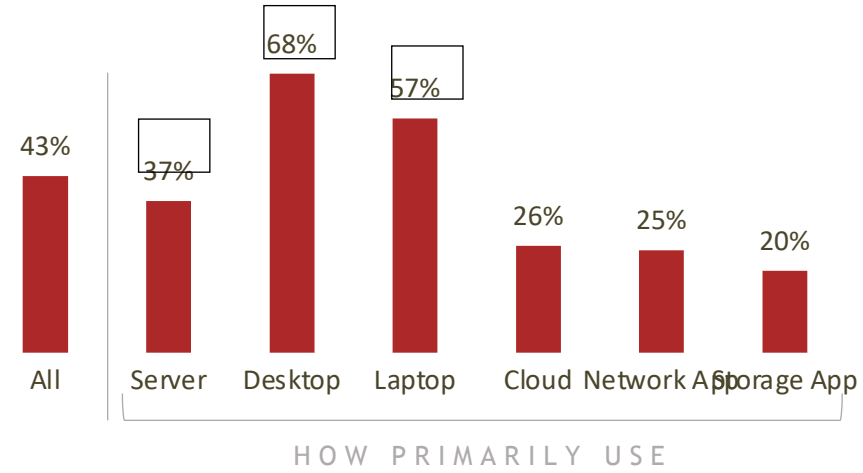


SOURCE: Q3. Is FreeBSD your daily driver (the operating system you use most frequently)? | Q4. If FreeBSD support on desktop/laptop hardware was roughly equivalent to that of Linux, would you use FreeBSD as your daily driver?

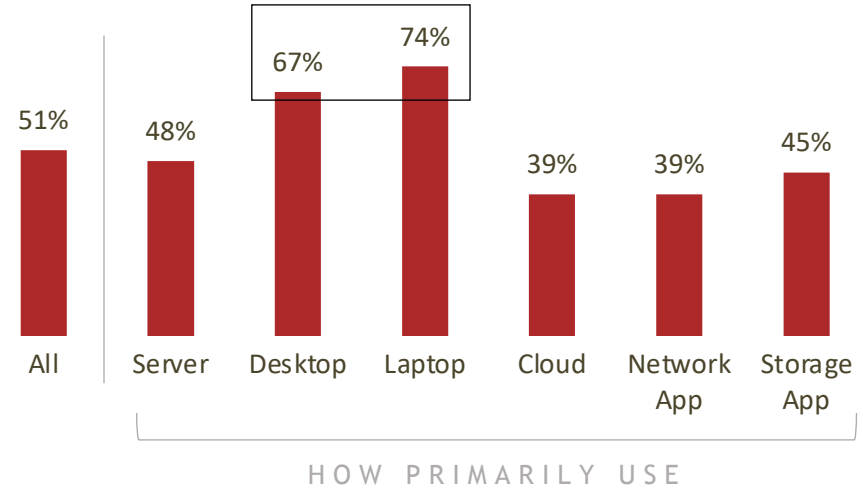
FreeBSD as Daily Driver

- Those using FreeBSD primarily on a desktop or laptop are most likely to already consider FreeBSD their daily driver, or to consider doing so with Linux-equivalent support.

Consider FreeBSD Daily Driver
(By How Primarily Use FreeBSD



Would Use as Daily Driver if DT/LT Support Equivalent to Linux
(Among Those Who Do Not Consider Daily Driver)



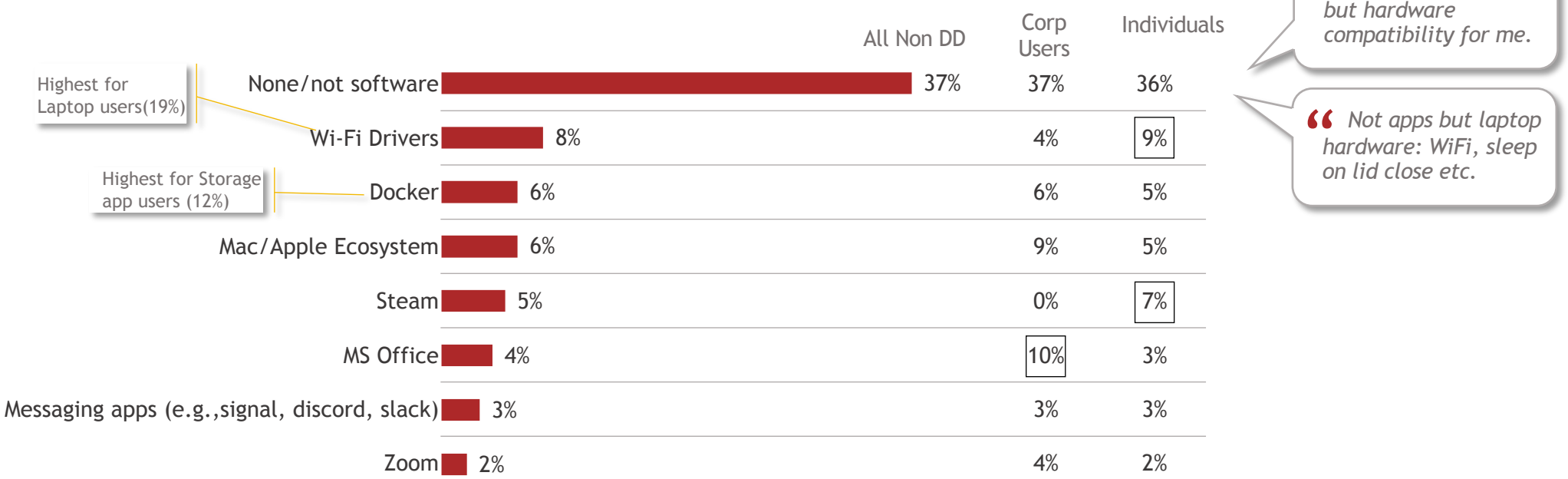
SOURCE: Q3. Is FreeBSD your daily driver (the operating system you use most frequently)? | Q4. If FreeBSD support on desktop/laptop hardware was roughly equivaled to that of Linux, would you use FreeBSD as your daily driver?

FreeBSD As Daily Driver

- There is no one software app to point to that would motivate large number of FreeBSD users to consider FreeBSD their daily driver – it's less about software and more about hardware support.
  - Among those mentioned, Wi-Fi drivers, docker, steam and MS office are most widely mentioned.

Software Apps Would Need to Run FreeBSD as Daily Driver*

(Among Those For Who Do Not Consider FreeBSD Daily Driver)



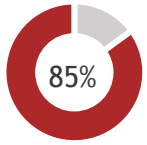
*Coded response to open-ended question

SOURCE: Q5. Which software applications would you need in order to run FreeBSD as your primary daily driver that does not work today? (among those for whom not daily driver) (open end)

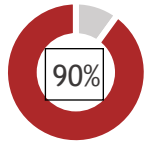
Firewalls

- The vast majority of FreeBSD users use firewalls, typically pf or (to a lesser extent) ipfw.
- Individuals are less likely than Corporate Users to use firewalls, and among those who do, are less likely to be able to name which one they use.

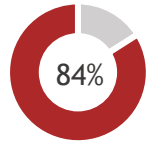
Use Firewalls:
(Among All Respondents)



All



Corp Users



Individuals

Firewall used:
(Among Those Who Use Firewalls)

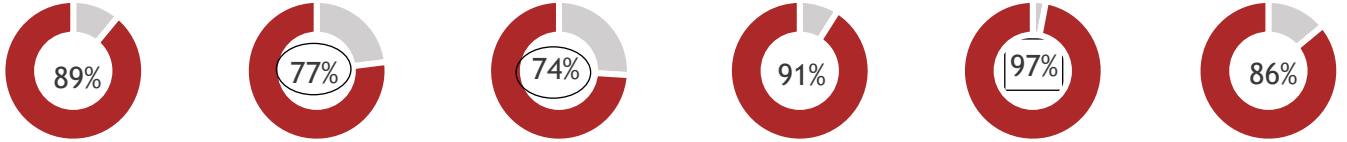
	All Firewall Users	Corp Users	Individuals
pf	71%	77%	69%
ipfw	31%	38%	28%
ipfilter/ipf	4%	5%	3%
Other	5%	5%	4%
Don't know	7%	2%	9%

SOURCE: Q14. Which firewalls do you use? (Check all that apply)

Firewalls

- Those who use FreeBSD primarily on a Desktop and Laptop are less likely than others to use firewalls (though most do), and are less likely to know which one(s) they use.

Use Firewalls:
(By How Primarily Use FreeBSD)



Firewall used:
(Among Those Who Use Firewalls)

	Server	Desktop	Laptop	Cloud	Network App	Storage App
pf	76%	58%	61%	73%	81%	72%
ipfw	32%	31%	33%	27%	30%	26%
ipfilter/ipf	3%	3%	4%	5%	7%	7%
Other	5%	6%	3%	4%	7%	4%
Don't know	3%	14%	13%	5%	7%	13%

SOURCE: Q14. Which firewalls do you use? (Check all that apply)

Server, Cloud, Laptop/Desktop Users: In-Depth

Servers

- The server workloads FreeBSD is most commonly used for are storage and web serving.
- ZFS is the most valued server workload attribute across all segments, with access to security patches close behind. Beyond this, though, the relative importance of attributes is driven by how respondents primarily use FreeBSD.

Cloud:

- Most respondents use FreeBSD on an on-premises cloud, but AWS is also widely used by those who primarily use FreeBSD on the cloud.
- There is no obvious gap in cloud providers – but Linode may be one that some Cloud-primary users would like to use but don't currently.

Desktop/Laptop

- No one Graphical desktop environment dominates but KDE Plasma and Xfce are used most.
- Lenovo/IBM is by far the most important laptop brand for those using FreeBSD on laptops; Dell is a distant second (higher for Corp Users than Individuals).

Server Users: In-Depth

- Those who use FreeBSD on servers are primarily using for multiple workloads – storage, web serving and firewall/proxy/router chief among them.

Server Workloads Use FreeBSD For

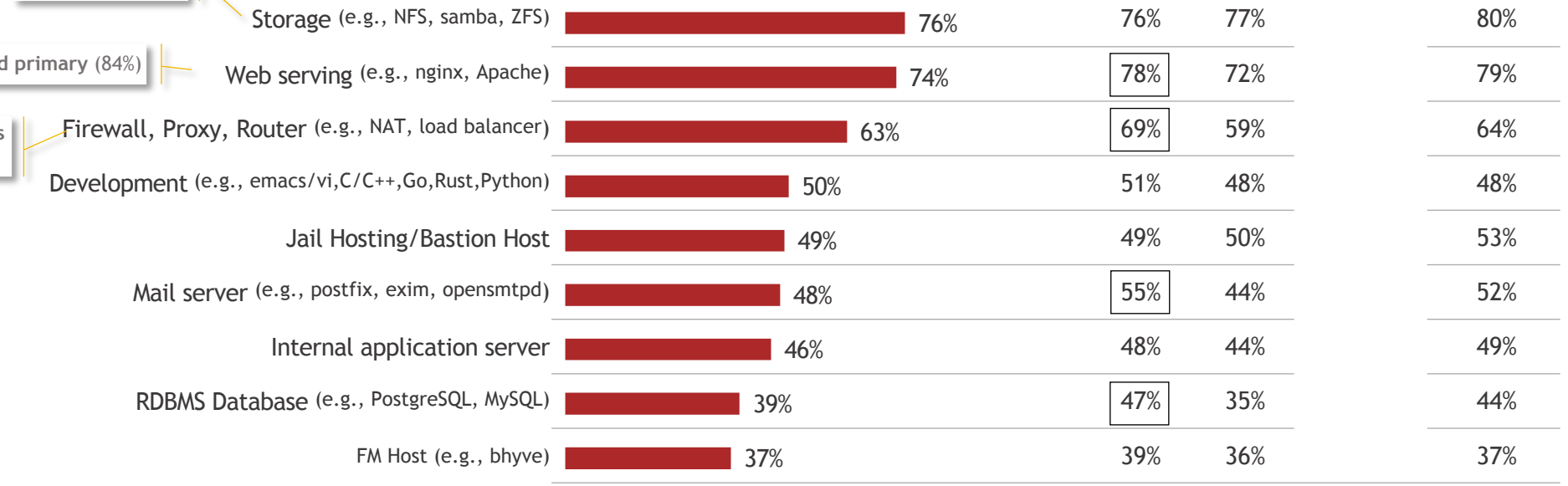
(Among Those Who Use FreeBSD on Servers)

Top Mentions

Esp **Storage Apps primary** (98%)

Esp **Cloud primary** (84%)

Esp **Network apps primary** (95%)



SOURCE: Q23.Which server workloads do you use FreeBSD for? (check all that apply)?

Server Users: In-Depth

- ZFS is, by far, the most important workload attribute for those who use FreeBSD on servers, followed by access to security patches. These are particularly important to those who primarily use FreeBSD on a server.
- Other important attributes include access to file system performance, jails and firewalls.

Most Important Workload Attributes

(Among Those Who Use FreeBSD on Servers)

Top Mentions

	All Server Users	Corp Users	Indivi-duals	*Primarily* Use on Servers
ZFS	78%	76%	78%	81%
Access to security patches	66%	69%	65%	68%
Filesystem performance	58%	62%	55%	59%
Jails	53%	50%	56%	56%
Network: Firewall	52%	55%	51%	52%
In-Place upgrades (vs. fresh install)	43%	42%	43%	45%
Up-to-date server applications	40%	43%	39%	43%
Network: Storage (e.g., iSCSI, NFS, smb/Samba)	38%	37%	38%	40%
Network: Performance bandwidth	37%	42%	33%	37%
Virtualization host (bhyve, SRIOV)	36%	36%	37%	37%

SOURCE: Q24. Which of the following server workload attributes are most important to you? [Check up to 10]

Server Users: In-Depth

- Other attributes like routers, block storage performance, and power efficiency (among others) are important to a much smaller proportion of server users.
  - Power efficiency is more important to Individuals than Corporate Users, perhaps because of their reliance on laptops.

Other Important Workload Attributes

(Among Those Who Use FreeBSD on Servers)

Second tier mentions

	All Server Users	Corp Users	Indivi-duals	*Primarily* Use on Servers
Network: router	28%	28%	28%	27%
Block Storage performance (e.g., NVMs)	28%	32%	26%	27%
Power Efficiency	25%	17%	29%	23%
Security:Application (ASLR,spectre/meltdown mitig.)	24%	23%	26%	24%
Security:Userland controls (e.g., Capsicum, MAC, jails)	23%	24%	23%	23%
Network: NAT	23%	27%	20%	22%
Virtualization Guest (e.g., optimized paravirtual drivers)	20%	23%	20%	20%
Config mgmnt support (ansible, chef, salt, packer, puppet)	20%	18%	21%	20%
Network: Performance – PPS	13%	17%	11%	13%
Installation size (e.g., base system)	13%	13%	12%	13%

Esp **Cloud primary** (33%)

Esp **Network app primary** (32%)

SOURCE: Q24. Which of the following server workload attributes are most important to you? [Check up to 10]

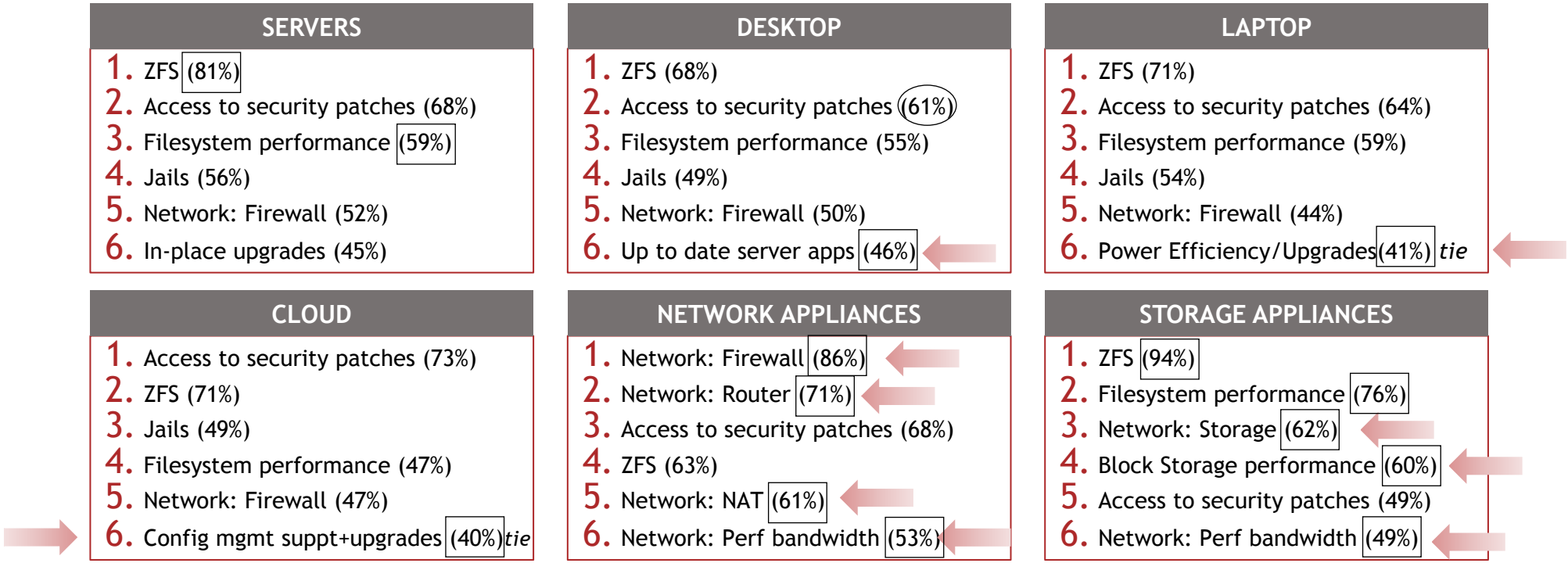
Server Users: In-Depth

- ZFS important across all user segments, with access to security patches and fileysystem performance also important to many.
  - Beyond this, priorities differ based on how respondents primarily use FreeBSD – especially for those who primarily use FreeBSD on Network or Storage appliances.

Most Important Workload Attributes - By How Primarily Use

(Among Those Who Use FreeBSD on Servers)

Top Mentions Within Group



SOURCE: Q24. Which of the following server workload attributes are most important to you? [Check up to 10]

Server Users: In-Depth

- There is considerable variation in the relative importance of server workload attributes based on how users primarily use FreeBSD.

Most Important Workload Attributes - By How Primarily Use
(Among Those Who Use FreeBSD on Servers)
Top Mentions Within Group

NOTE: The number refers to the rank in importance (based on % checked)

	RELATIVE IMPORTANCE BY HOW PRIMARILY USE					
	Servers	Desktop	Laptop	Cloud	Network App	Storage App
ZFS	1st	1st	1st	2nd	4th	1st
Access to security patches	2	2	2	1	3	5 (tie)
Filesystem performance	3	3	3	4		2
Jails	4	4	4	3		
Network: Firewall	5	5	5	5	1	
In-place upgrades	6		6(tie)	6 (tie)		
Up to date server apps		6				
Network: Storage						3
Network: Perf Bandwidth					6	5 (tie)
Network: Router					2	
Block Storage performance						4
Power efficiency			6 (tie)			
Network: NAT					5	
Configuration mgmt. support				6 (tie)		

SOURCE: Q24. Which of the following server workload attributes are most important to you? [Check up to 10]

Cloud Users: In-Depth

- On-prem/private cloud is by far the most widely used cloud platform by those who use FreeBSD on the cloud.
  - But for those who use FreeBSD *primarily* on the cloud, AWS (and less so Vultr) are almost as widely used as private.
  - There does not appear to be a glaring lapse in cloud providers users would like to use, with fewer than 1 in 10 mentioning any one cloud provider. Linode might have some traction among those primarily using FreeBSD on cloud.

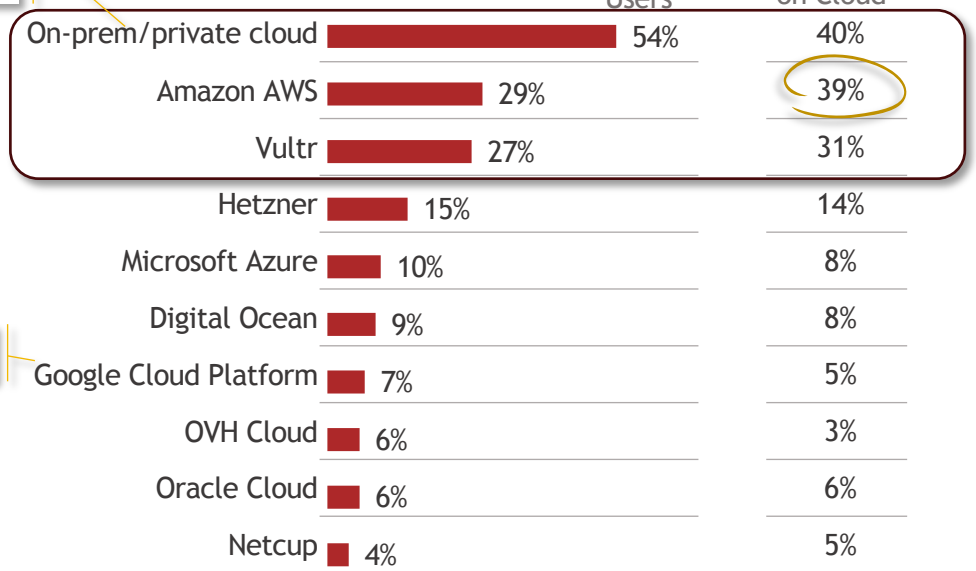
Cloud Providers Used with FreeBSD

(Among Those Who Use FreeBSD on Cloud)

Top Mentions

Esp:
- **Corp Users** (64%)
- **Server prim** (61%)
- Loc in **Europe** (60%)

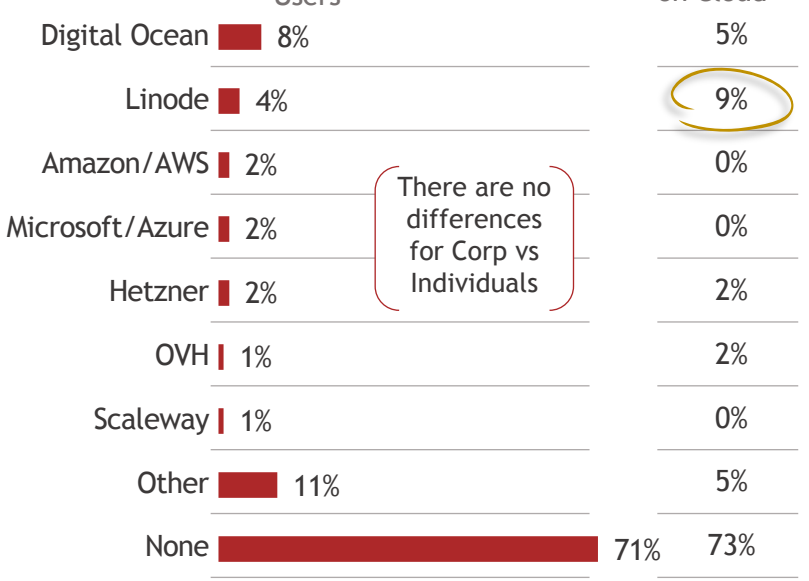
Esp: **Corp Users** (11%)



Cloud Providers Would LIKE to Use but Don't

(Among Those Who Use FreeBSD on Cloud)

Top Mentions



**Sample size small (n<50); interpret cautiously

SOURCE: Q25. Which cloud providers do you use when running FreeBSD? (check all that apply) | Q26. Which cloud providers do you not use currently, but wish you could use to run FreeBSD? (coded response to open ended question)

Laptop & Desktop Users: In-Depth

- KDE Plasma and Xfce are the most widely used graphical desktop environments for those using FreeBSD on a desktop or laptop.
  - FVWM is more popular among those primarily using FreeBSD on a desktop, but even here it is not widely used.

Graphical Desktop Environment/WM Used Most

(Among Those Who Use on Desktop and/or Laptop)

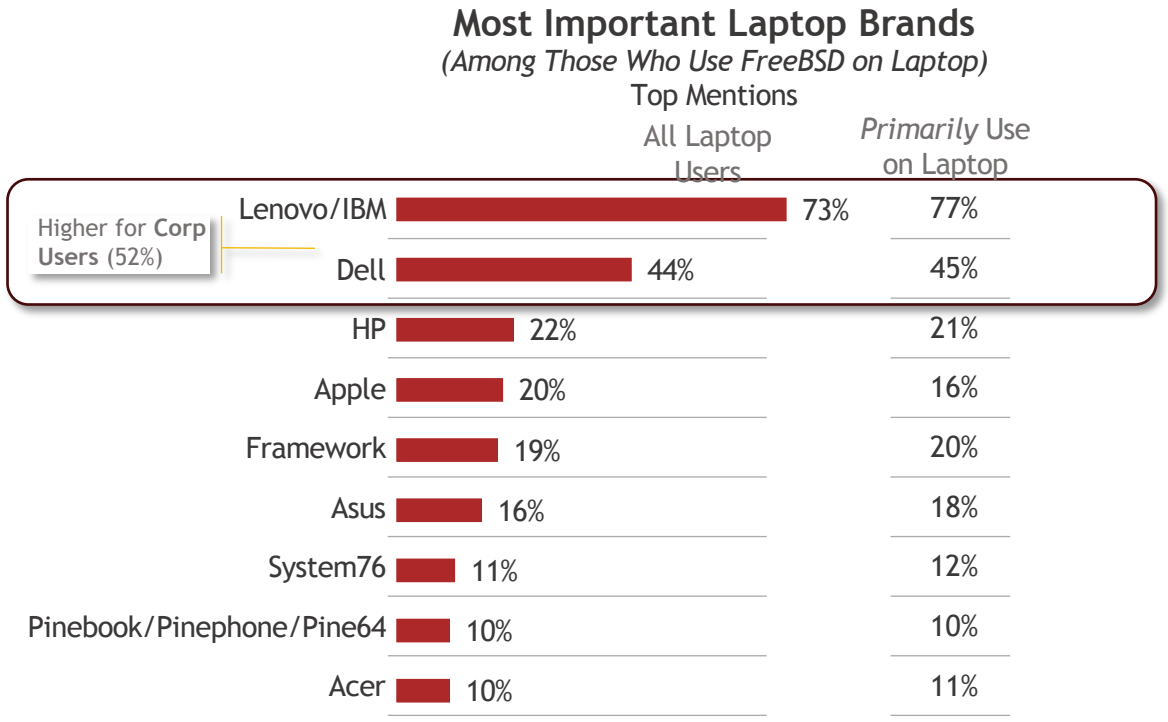
Top Mentions

	All Desktop/ Laptop Users	*Primarily* Use FreeBSD On.... Desktop	Laptop
KDE Plasma	21%	18%	21%
Xfce	20%	24%	19%
I3	9%	6%	9%
GNOME	8%	8%	7%
Sway	4%	4%	8%
Dwm	4%	4%	9%
MATE	4%	5%	4%
FVWM	4%	7%	<1%
Fluxbox	3%	3%	2%
NONE – I don't use	5%	2%	1%

SOURCE: Q28. Which graphical desktop environment or window manager do you use the most? (Check one)

Laptop Users: In-Depth

- Lenovo/IBM and Dell are, by far, the most important laptop brands for those using FreeBSD on a laptop.



SOURCE: Q27. Indicate which three laptop brands are most important to you for running FreeBSD as a laptop OS. (Check up to 3)

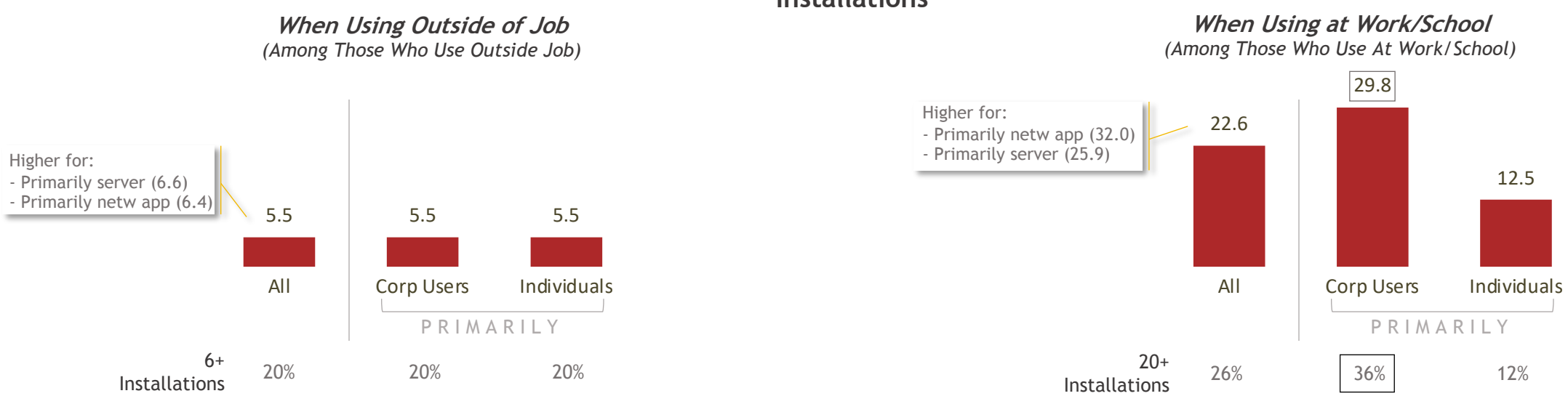
FreeBSD Installations & Releases

- The typical FreeBSD user has nearly 23 installations at work, vs. just 5-6 outside of work.
- In both settings, those using primarily on network appliances or servers have more installations than other users.
- Users expect major/LTS branches to be supported for 3-4 years on average, but Corporate Users and those using primarily on Network appliances have even longer expectations than others.
- Importantly, there is little appetite to pay for extended support in a shortened LTS timeframe.
- There is considerable variation in preferences for major upgrades, but most generally expect annual or bi-annual upgrades.
- Hardware is expected to last 4-10 years; those primarily working on the cloud have somewhat lower time horizon.

Number of Installations

- The average FreeBSD user in a work-setting has 4x the number of installations as those using outside of work.
  - In both settings, those who use primarily on servers and network appliances have more installations than other users have.

Number of Physical & Virtual FreeBSD Installations



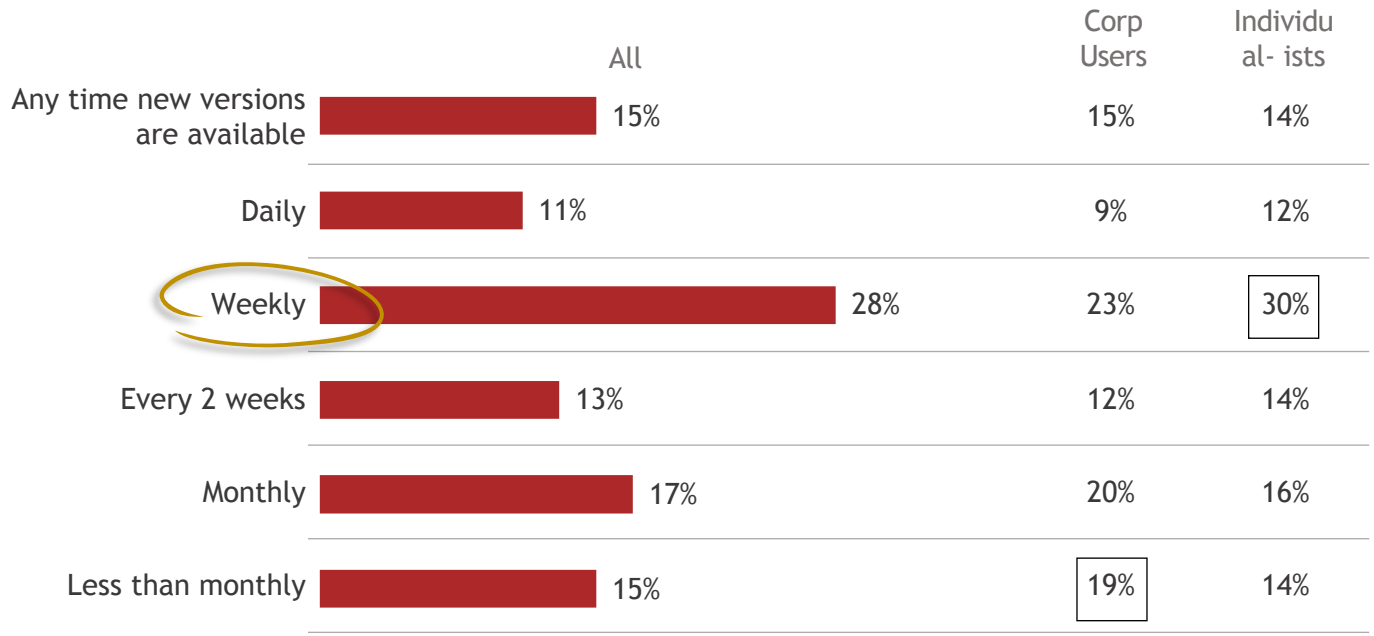
SOURCE: Q15. When using FreeBSD outside of your job, approximately how many physical and virtual FreeBSD Installations do you have? | Q16. When using FreeBSD at work/school, approximately how many physical and virtual FreeBSD installations does the organization have?

Package Upgrades

- There is wide variation in the frequency with which users prefer to upgrade packages, but weekly is most common, particularly among Individuals.
  - Corporate Users tend to upgrade less frequently.

Package Upgrade Frequency

(Among All Respondents)



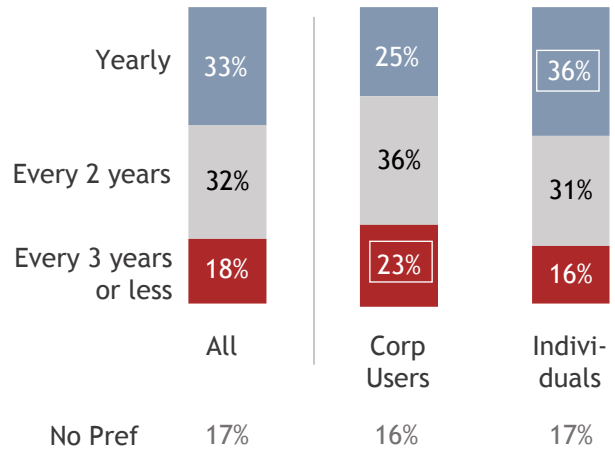
SOURCE: Q13. How often do you upgrade your installed packages?

Upgrade Preferences & Hardware Expectations

- There is considerable variation in the preferred frequency of major upgrades, but most seem to expect annual or bi-annual upgrades – with some Corporate Users looking to stretch them out over an even longer timeframe.
  - Most users expect their hardware to last somewhere in the 4-6 or 7-10 year time frame. Those primarily on the cloud have a shorter time horizon, while those on storage appliances, desktops and laptops expect a 10_ year life.

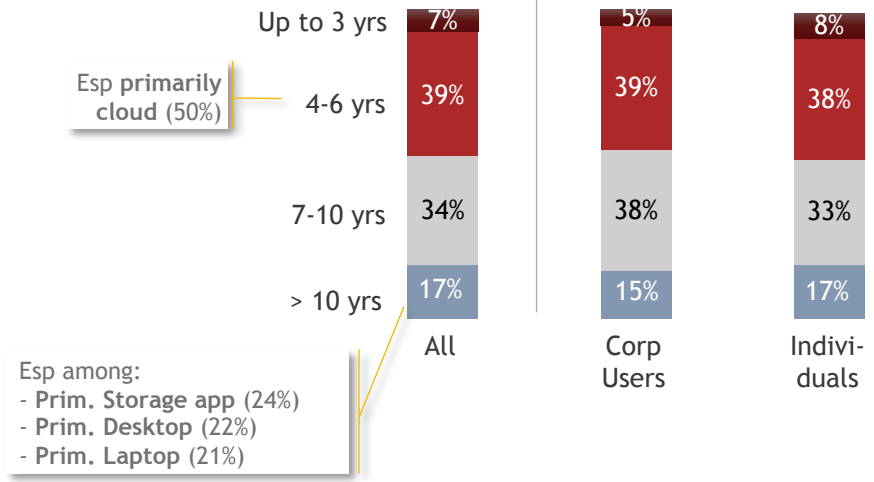
Preferred Frequency of Major Upgrades

(Among All Respondents)



Expected Life of Hardware Running FreeBSD

(Among All Respondents)



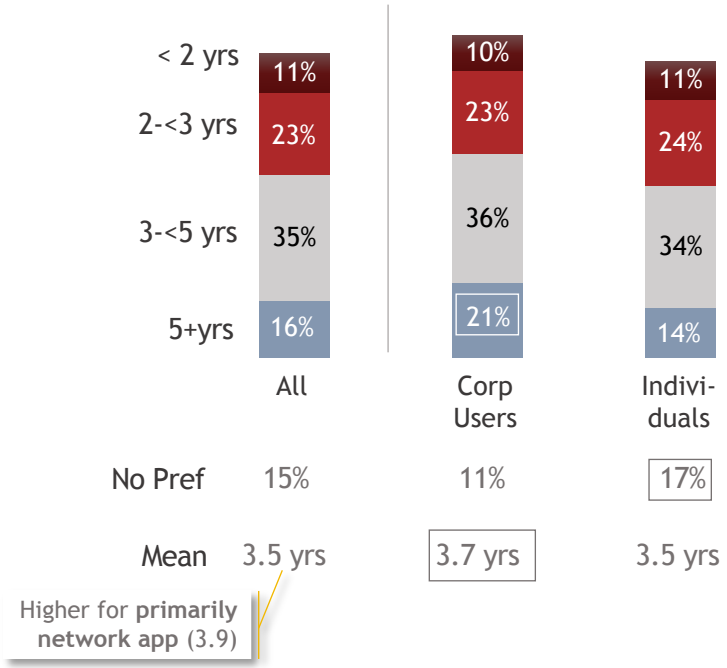
SOURCE: Q19 How often do you prefer to make major version upgrades (e.g. 13.2 -> 14.0 in order to pick up new features, API/ABI changes, subsystem improvements, etc.(i.e., backing up data in prep for the upgrade) | Q20. When you install FreeBSD onto hardware (not a VM), what is the expected life of the hardware running FreeBSD?

Major/LTS Branch Support

- The typical FreeBSD user expects major/LTS branches to be supported for 3-4 years, but there is some variation.
  - Corporate Users have a longer-term view than Individuals, many of whom don't have a preference.
  - Importantly, there is little to no appetite for fee-based extended support, although some segments show lukewarm support for the idea.

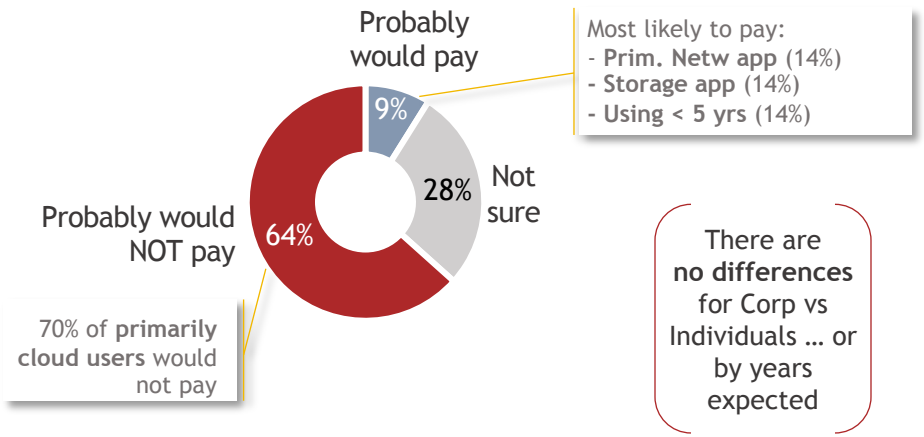
Years Expect Major/LTS Branches to be Supported

(Among All Respondents)



Willingness To Pay For Extended Support if Shortened LTS Timeframe

(Among All Respondents)



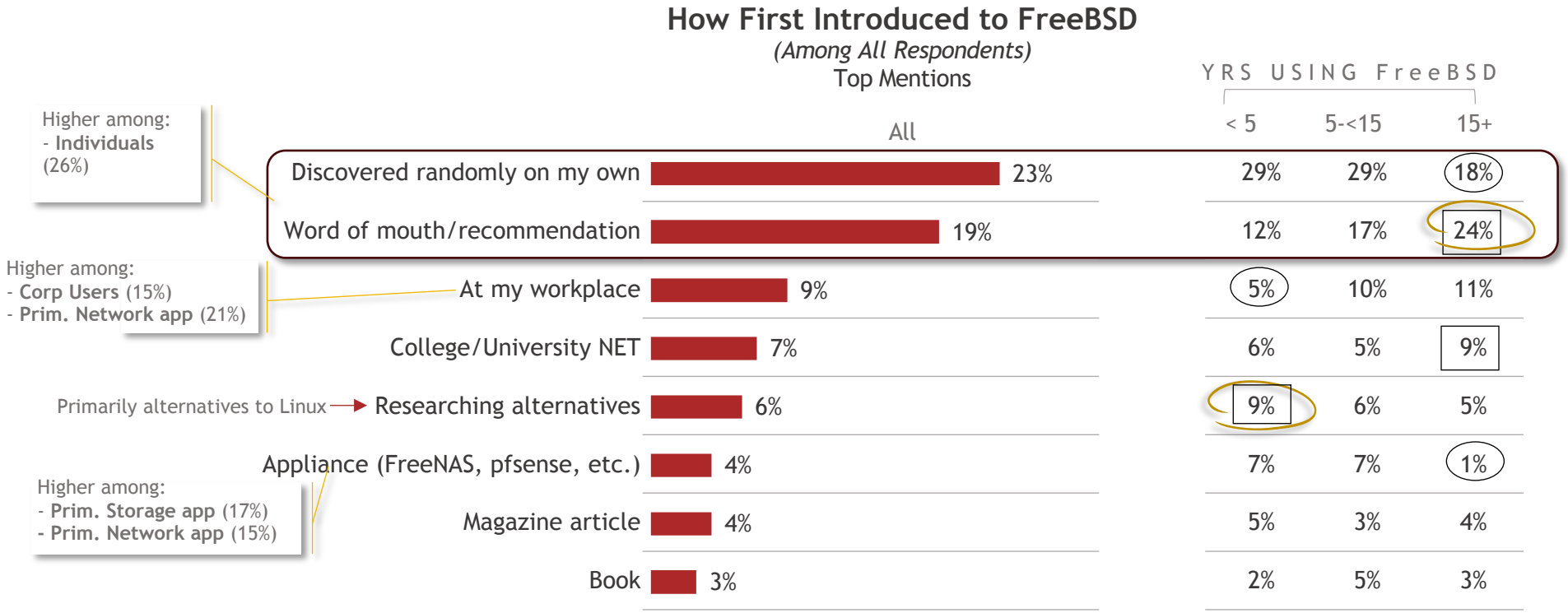
SOURCE: Q17. Ideally, FreeBSD major branches (or an LTS branch) will be supported for ___ years (i.e. security fixes, critical bugs, packages) | Q18. If the project were to shorten LTS below your ideal timeframe, would you pay for extended support?

Learning About & Staying Current with FreeBSD

- Most discovered FreeBSD randomly or through recommendation - although it seems that word of mouth is not generating as many new users as in years past.
- The Project website is the main channel for keeping current with FreeBSD, but beyond this, big differences exist by segment.
- Most say they know where to get help when needed (typically documentation, man pages or forums), but newer users are less clear; they tend to look outside FreeBSD for help (e.g., Reddit, YouTube or internet blogs).
- Ratings for FreeBSD's training and support are lukewarm. The quality of materials is generally adequate, but high negatives on other attributes are a concern, especially for new users and those outside of EU/NA. Access to mentors is a particular weakness.
- Content improvements (e.g., removing outdated info, better organization/consolidation) are among the top suggestions for improving the learning process.

Learning About FreeBSD

- Users typically learned about FreeBSD through random discovery or recommendation.
  - Those new to FreeBSD in the past 5 years are less likely than others to have been referred and are more likely to have found while researching Linux alternatives.
  - Word of mouth does not seem to be the catalyst it was 15 years ago.



SOURCE: Q30. How were you first introduced to FreeBSD? (check one)

Keeping Current on FreeBSD

- The FreeBSD website is a key resource across all segments for keeping current on FreeBSD.
  - There are notable differences in other resources, particularly based on community tenure. Those here 15+ years rely heavily on mailing lists, but newer entrants look to Reddit, YouTube and Discord.

Sources Used to Keep Current on FreeBSD

(Among All Respondents)

Top Mentions

	All	YRS USING < 5	YRS USING 5-<15	YRS USING 15+
FreeBSD website	60%	58%	61%	60%
Mailing lists	45%	22%	43%	60%
FreeBSD Forums	40%	43%	39%	39%
FreeBSD Foundation newsletter	27%	19%	28%	32%
External blog posts	26%	26%	30%	23%
FreeBSD Journal	25%	22%	28%	26%
Reddit	24%	30%	24%	20%
BSD Now Podcast	18%	24%	23%	12%
YouTube	18%	30%	18%	10%
FreeBSD Foundation blog posts	15%	18%	14%	15%
IRC	15%	11%	15%	18%
Discord	8%	13%	6%	5%

Esp Corp Users (52%)

Only 35% outside EU/NA

Esp N.Amer (32%)

Esp
- N.Amer (29%)
- Individuals (26%)

Esp Individuals (21%)

Esp Individuals (17%)

Esp Individuals (9%)

SOURCE: Q21. Which sources do you use most to keep current with FreeBSD? (check up to 5)

Keeping Current on FreeBSD

- Sources used also vary by how primarily use FreeBSD.
  - The FreeBSD Project website is #1 resource in all segments, but Forums are more popular for desktop and laptop users, while mailing lists are popular for server and cloud users.
  - The BSDNow Podcast is a top-five resource for laptop users;
  - Reddit is popular among Network and Storage appliance focused users.

Sources Used to Keep Current on FreeBSD

(By How Primarily Use FreeBSD)

SERVERS

1. FreeBSD Website (61%)
2. Mailing Lists (50%)
3. FreeBSD Forums (39%)
4. FreeBSD Foundation Newsletter (31%)
5. External Blog Posts (31%)

DESKTOP

1. FreeBSD Website (61%)
2. FreeBSD Forums (47%)
3. Mailing Lists (40%)
4. External Blog Posts (26%)
5. FreeBSD Journal (26%)

LAPTOP

1. FreeBSD Website (59%)
2. FreeBSD Forums (45%)
3. Mailing Lists (38%)
4. FreeBSD Journal (27%)
5. BSDNow Podcast (23%)

CLOUD

1. FreeBSD Website (62%)
2. Mailing Lists (52%)
3. FreeBSD Foundation Newsletter (33%)
4. FreeBSD Forums (30%)
5. External Blog Posts (28%)

NETWORK APPLIANCES

1. FreeBSD Website (54%)
2. Mailing Lists (33%)
3. External Blog Posts (32%)
4. Reddit (31%)
5. FreeBSD Forums (29%)

STORAGE APPLIANCES

1. FreeBSD Website (56%)
2. FreeBSD Journal (42%)
3. Mailing Lists (38%)
4. FreeBSD Forums (38%)
5. FreeBSD Newsletter + Reddit (29%) *(tie)*

SOURCE: Q21. Which sources do you use most to keep current with FreeBSD? (check up to 5)

Getting Help with FreeBSD

- Most users say they know where to go for help with FreeBSD, although a notable minority of new users express concern.
  - FreeBSD documentation is the go-to resource in all segments, but manual pages and Forums are also widely used.
  - New users rely more heavily than others on external sources like Reddit,YouTube and blog pages on the internet.

Sources Used for Help With FreeBSD

(Among All Respondents)

Top Mentions

	All	YRS USING < 5	YRS USING 5-<15	YRS USING 15+
FreeBSD Documentation	84%	86%	84%	83%
Manual pages	62%	52%	58%	70%
FreeBSD Forums	57%	61%	59%	55%
Blog pages on the internet	44%	51%	51%	36%
FreeBSD Wiki	42%	43%	43%	42%
Mailing list posts	27%	12%	22%	40%
Source code	22%	12%	21%	29%
Reddit	14%	23%	14%	9%
Instant messaging (IRC, matrix, etc)	14%	14%	14%	13%
Stack overflow	13%	13%	15%	12%
YouTube	10%	18%	9%	5%

Esp Corp Users (32%)

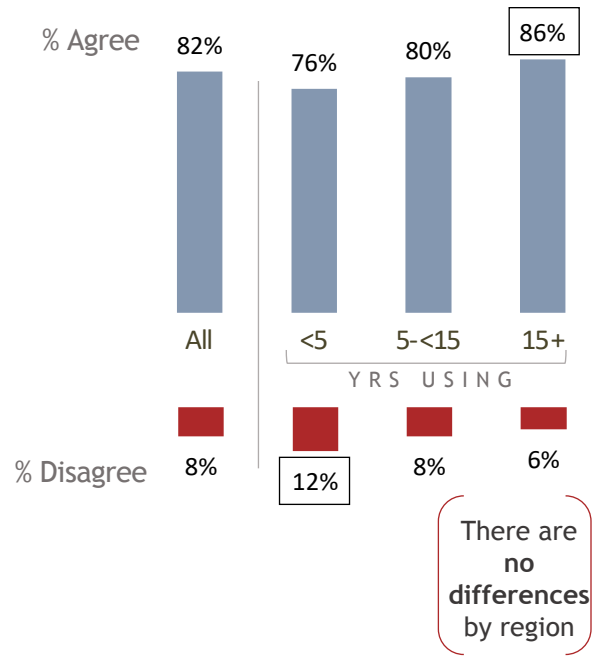
Only 49% outside EU/NA

Especially Individuals (17%) North Amer (17%)

Esp outside EU/NA (17%)

Understand How To Get Help

(Among All Respondents)



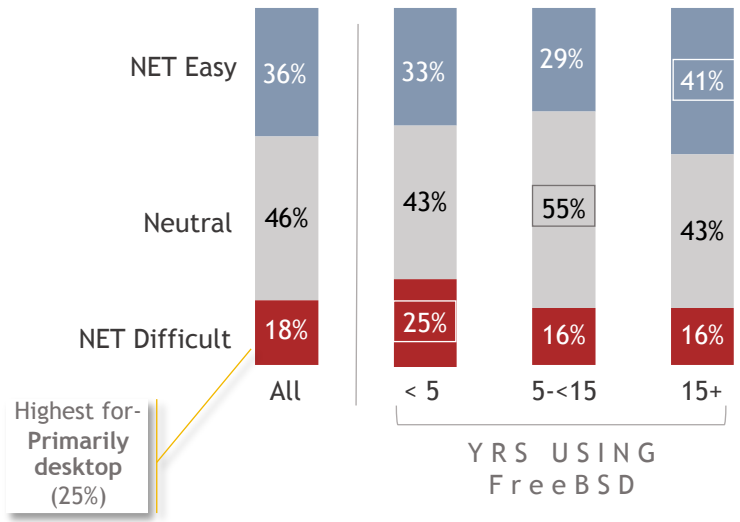
SOURCE: Q22. Which sources do you use most for help with FreeBSD? (Check up to 5) | Q41G. Please indicate whether you agree or disagree with the following (agree, disagree, no opinion). "I understand how to get help if I run into a problem"

Perceptions of Training & Support

- FreeBSD receives lukewarm ratings for its training & support, with most in the "neutral range".
  - The quality of resources are reasonably strong, but in other respects, bottom-two box scores are high.
  - Peer mentoring is a particular weak spot.
  - Importantly, newer users are less upbeat about training & support than others.

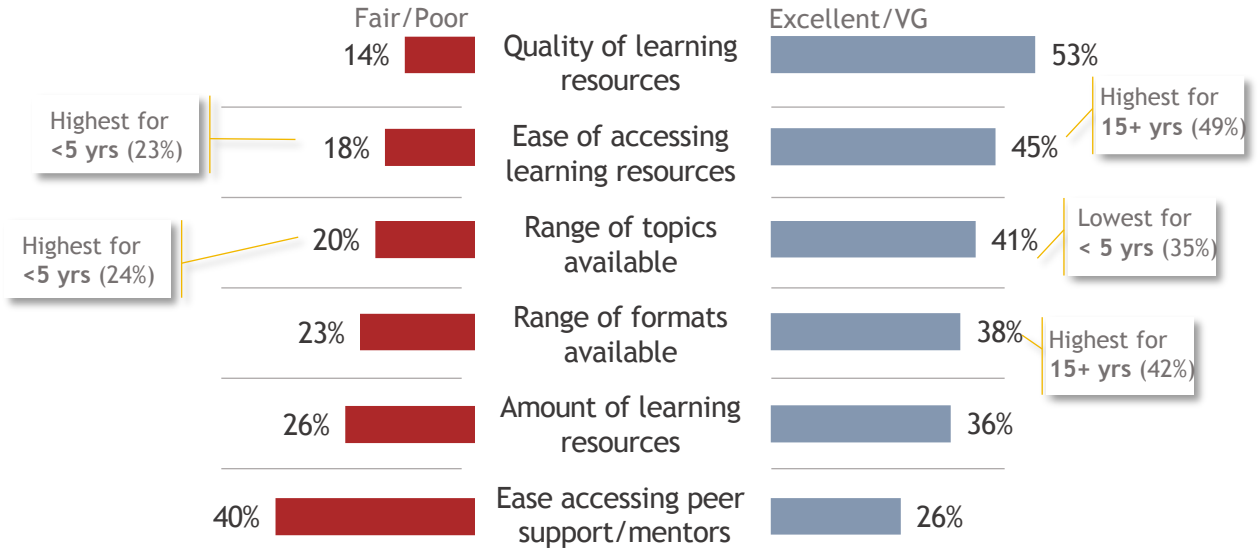
FreeBSD Training & Support Rating

(Among All Respondents)



Ratings of Specific Aspects

(Among All Respondents)



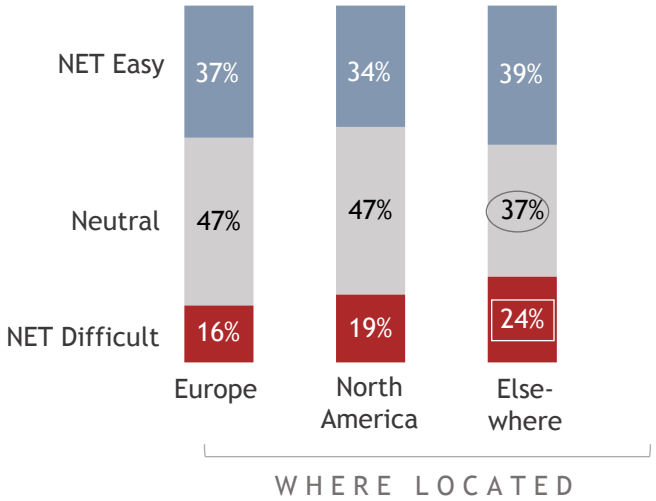
SOURCE: Q32. How would you rate the aspects of FreeBSD Training and Support? (5-pt scale from very difficult to very easy) | Q33. Please rate each of the following? (5-pt scale from poor to excellent)

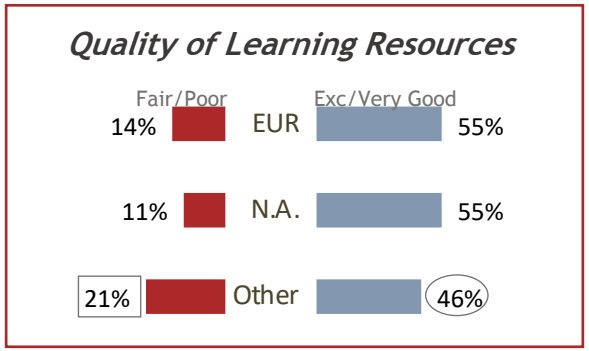
Perceptions of Training & Support

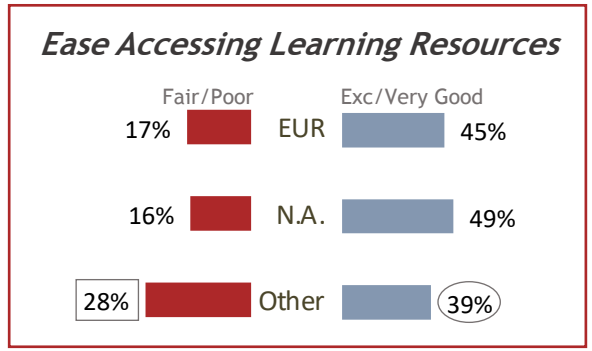
- Users located outside of Europe and North America are less satisfied with FreeBSD's training & support than others.
  - Fully one quarter say training and support is "difficult".
  - Their views toward quality, ease of access, range of topics and peer mentoring are particularly negative.

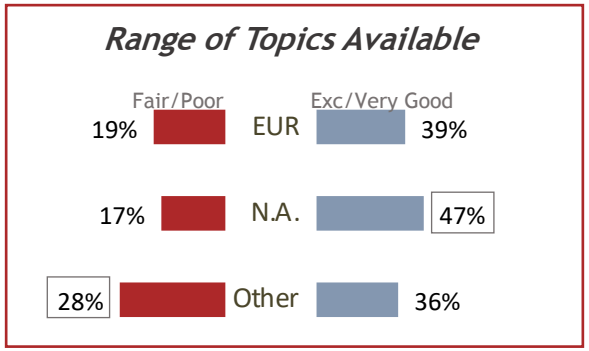
FreeBSD Training & Support Rating

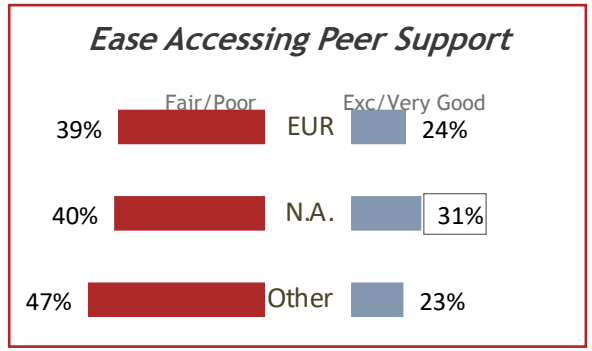
(By Region)











SOURCE: Q32. How would you rate the aspects of FreeBSD Training and Support? (5-pt scale from very difficult to very easy) | Q33. Please rate each of the following? (5-pt scale from poor to excellent)

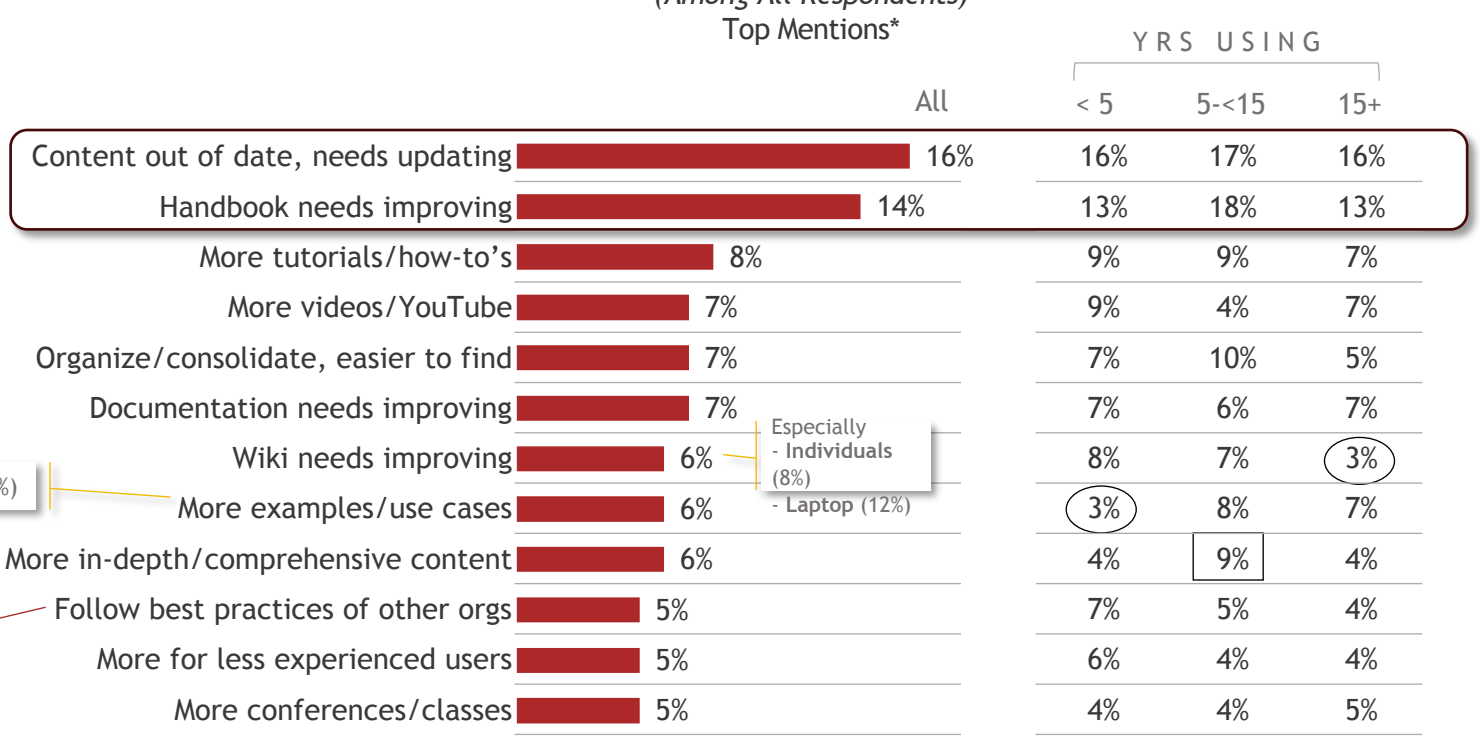
Learning Process Improvements

- Respondents offer a range of suggestions for improving the FreeBSD learning experience – with content updates (particularly in the handbook) most pressing.
  - Better organization and consolidating (including weeding out out-of-date content) would also go a long way toward improving perceptions.

Suggestions for Improving the Learning Process/Resources

(Among All Respondents)

Top Mentions*



"Some parts of the handbook, and many parts of the wiki seem to be years out of date.

"There's still a lot of outdated documentation out there, this can be confusing.

*Coded response to open ended question

SOURCE: Q34. What recommendations do you have for how the learning process and/or resources could be improved? (open end)

Perceptions of FreeBSD

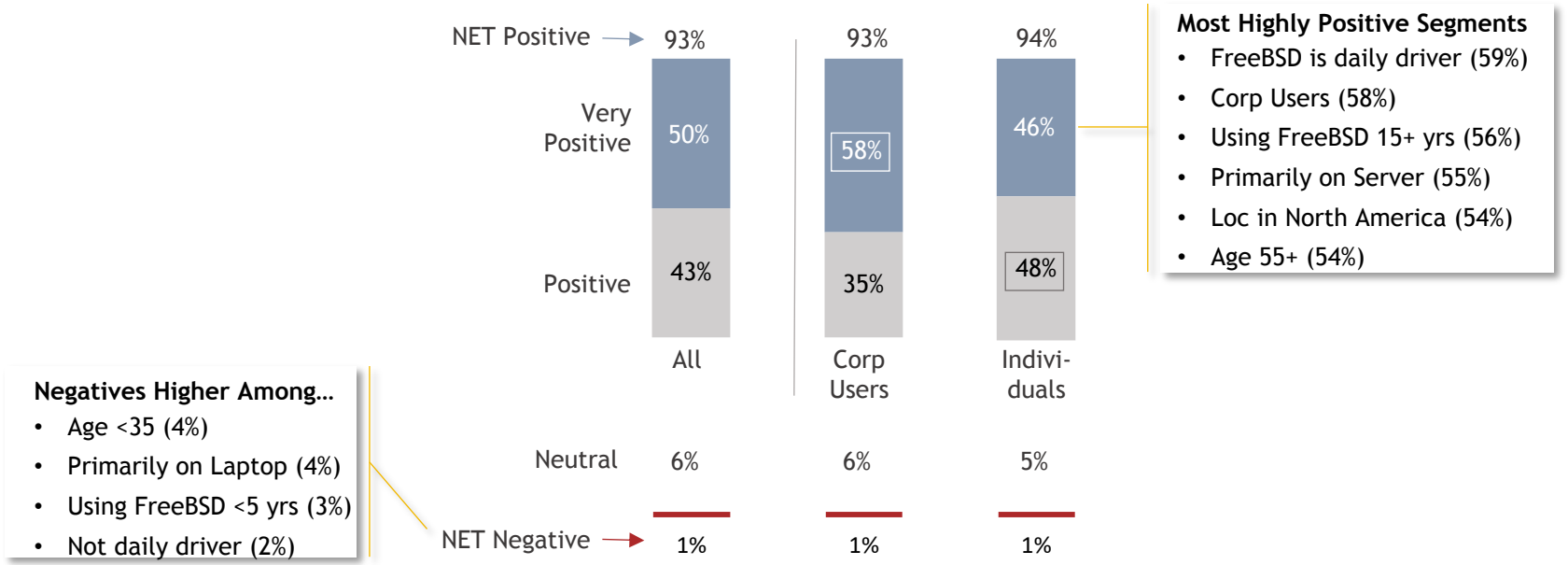
- Nearly all users are positive about their experience with FreeBSD overall – many highly so.
- It has proven to be a good way to learn about system administration and OS internals and many Corporate Users say it has had a positive impact on their careers.
- FreeBSD is widely seen as a complete and self-contained operating system, which is an important factor that made users want to continue with the project. Other factors that instilled loyalty include: ZFS, stability, simplicity and its fit as a UNIX-like alternative to Linux.
- Project does a good job on security handling. Many believe (especially those using primarily on storage appliances) that effective security should be provided “out of the box”.
- Users widely expect – and believe FreeBSD sets - reasonable defaults, even if they don’t always know how the defaults are set.
- Most say the community is “welcoming” although users outside of EU/NA do not entirely agree.

Overall Experience

- Nearly all respondents report a positive experience with FreeBSD overall.
  - Those most upbeat about their experience include those who consider FreeBSD their daily driver, Corporate Users, those using 15+ years and those using primarily on a server.
  - Younger, newer users are among those more likely to express a negative experience (although even here, the numbers are very low).

Rating of Experience with FreeBSD Overall

(Among All Respondents)



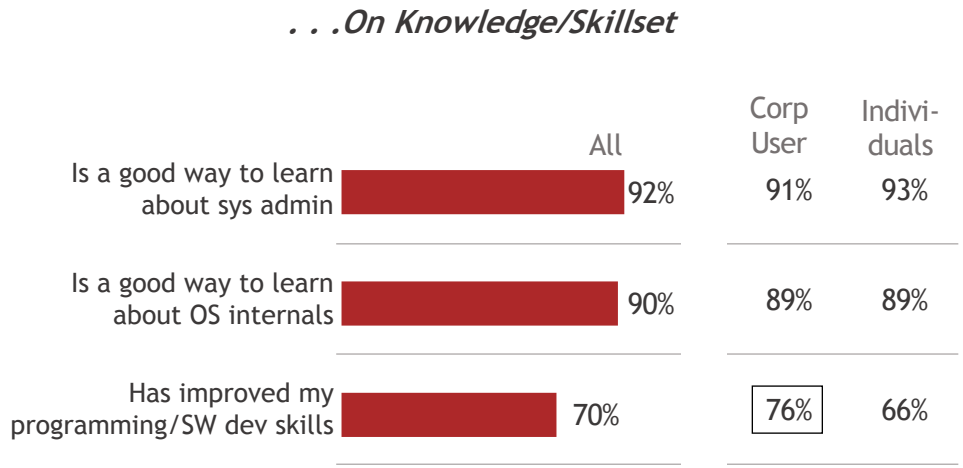
SOURCE: Q47. How would you rate your experience with FreeBSD overall? (5-pt scale from 'very negative to 'very positive')

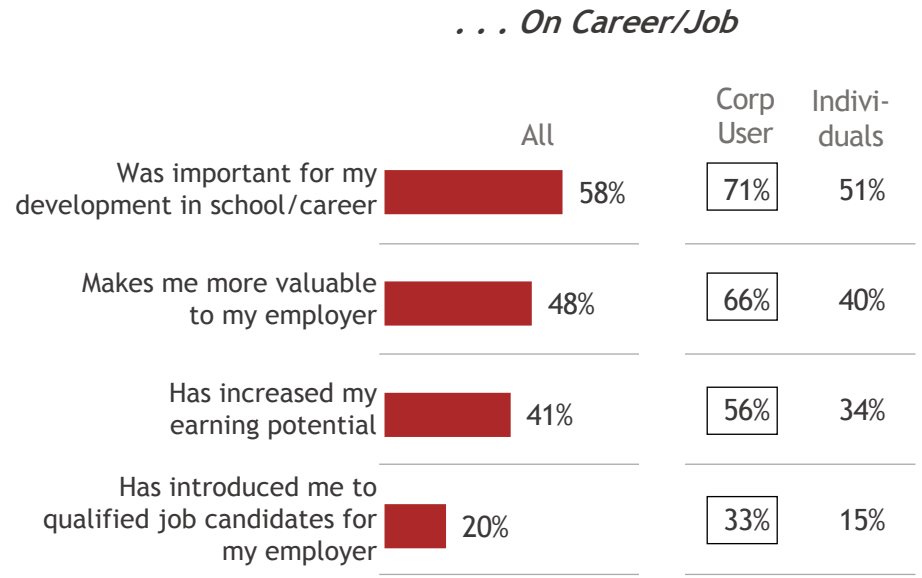
Impact of FreeBSD

- FreeBSD is almost universally seen as a good way to learn about system administration and OS internals.
  - Most Corporate Users say that learning FreeBSD has had a positive impact on their career, but they are less sure about whether it has translated to increased earning potential.

Impact of Learning FreeBSD. . .

(Among All Respondents)





SOURCE: Q48. To what extent do you agree or disagree with the following statements? Learning FreeBSD… (3-pt scale: agree, disagree, no opinion)

What Sparked Interest in FreeBSD

- The importance of ZFS is underscored by the fact that it is a key reason that sparked users' interest to continue with FreeBSD.
  - Stability, simplicity, being a complete system and the fact that it is a Unix-like alternative to Linux were other big factors driving commitment.

What Made Users Want To Continue With FreeBSD
(Top Themes)

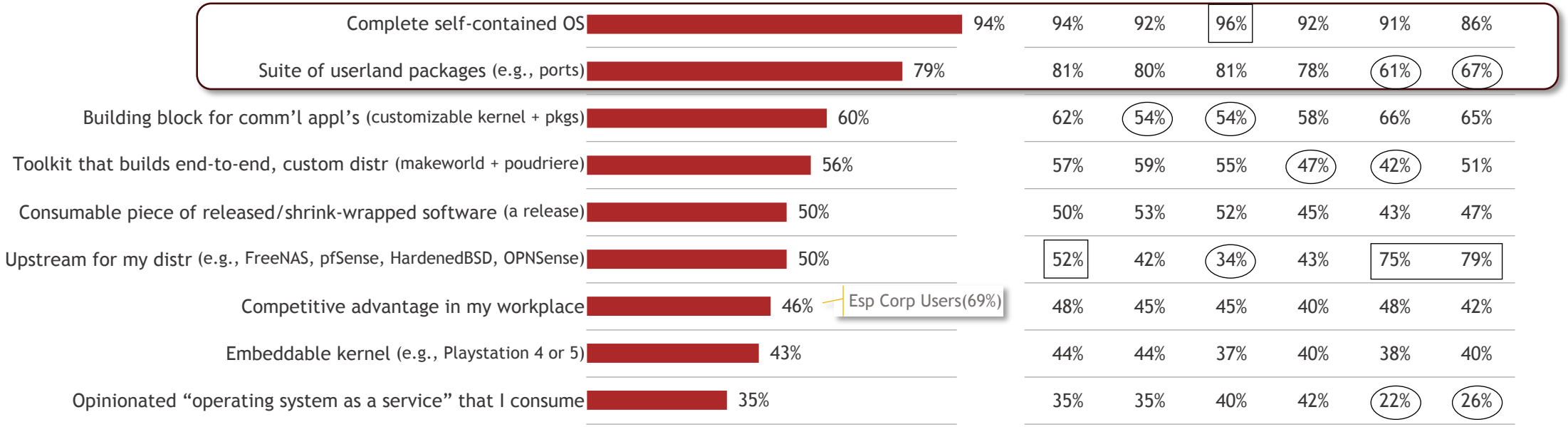
SOURCE: Q31. As best you can recall, what sparked your interest and made you want to continue to use FreeBSD?

Perceptions of FreeBSD Software

- Nearly all users see FreeBSD software as a “complete self-contained OS”, and a majority agree it is a “suite of userland packages”.
  - There is less unanimity about other aspects, but perceptions vary significantly by how FreeBSD is primarily used.
  - Corporate Users widely agree that FreeBSD software is “a competitive advantage in my workplace”.

How View FreeBSD Software

(Among All Respondents)



	All	PRIMARILY USE ON… Srvr	Desk top	Lap top	Cloud	Ntwk Apps	Storg Apps
Complete self-contained OS	94%	94%	92%	96%	92%	91%	86%
Suite of userland packages (e.g., ports)	79%	81%	80%	81%	78%	61%	67%
Building block for comm’l appl’s (customizable kernel + pkgs)	60%	62%	54%	54%	58%	66%	65%
Toolkit that builds end-to-end, custom distr (makeworld + poudriere)	56%	57%	59%	55%	47%	42%	51%
Consumable piece of released/shrink-wrapped software (a release)	50%	50%	53%	52%	45%	43%	47%
Upstream for my distr (e.g., FreeNAS, pfSense, HardenedBSD, OPNSense)	50%	52%	42%	34%	43%	75%	79%
Competitive advantage in my workplace	46%	48%	45%	45%	40%	48%	42%
Embeddable kernel (e.g., Playstation 4 or 5)	43%	44%	44%	37%	40%	38%	40%
Opinionated “operating system as a service” that I consume	35%	35%	35%	40%	42%	22%	26%

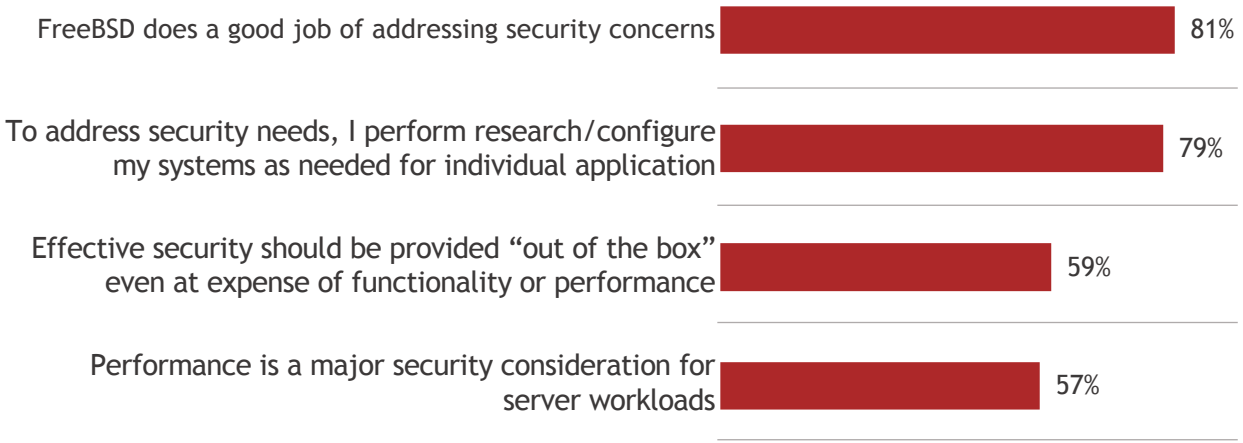
SOURCE: Q11. The FreeBSD Project produces software. How do you view FreeBSD’s software? (3-pt scale: agree, disagree, no opinion)

Perceptions of Security Issues

- FreeBSD is widely seen as doing a good job of addressing security concerns, particularly by those primarily using on servers.
  - Performance is a major security consideration for server workloads, and many expect that effective security should be provided out of the box (especially storage appliance users).

Perceptions of Security Issues

(Among All Respondents)



	PRIMARILY USE ON…					
	Srvr	Desk top	Lap top	Cloud	Ntwk Apps	Storage Apps
FreeBSD does a good job of addressing security concerns	84%	79%	76%	80%	77%	75%
To address security needs, I perform research/configure my systems as needed for individual application	85%	70%	69%	78%	76%	74%
Effective security should be provided "out of the box" even at expense of functionality or performance	62%	56%	54%	62%	57%	69%
Performance is a major security consideration for server workloads	61%	53%	48%	67%	56%	52%

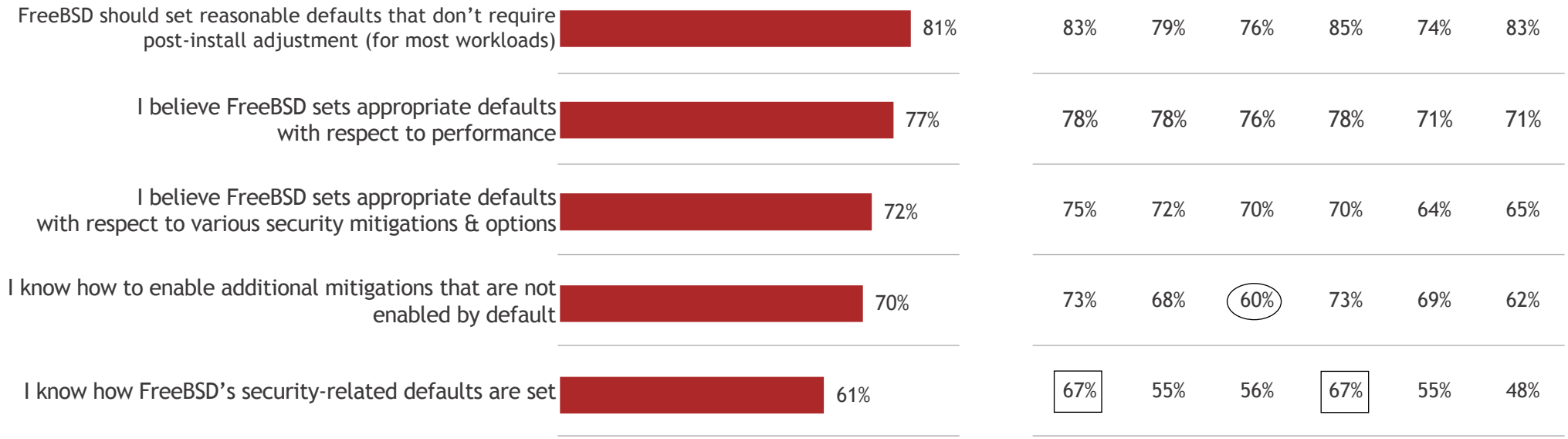
SOURCE: Q12. Rate the following statements (3-pt scale: agree, disagree, no opinion)

Perceptions of Security Issues

- Users widely expect – and believe FreeBSD sets – reasonable defaults, even if they don't necessarily know how defaults are set.
  - Laptop users are less likely than others to know how to enable additional mitigations that are not enabled by default.

Perceptions of Security Issues - Defaults

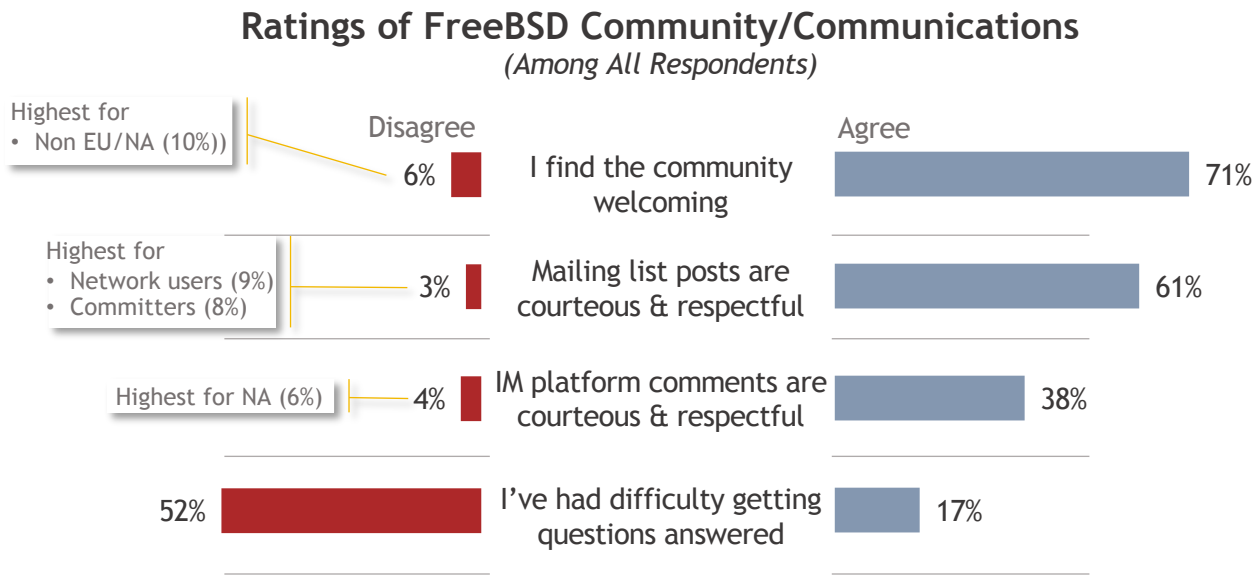
(Among All Respondents)



SOURCE: Q12. Rate the following statements (3-pt scale: agree, disagree, no opinion)

Community & Quality of Communication

- Respondents are mostly favorable about the communication and the welcoming climate in the community.
  - Seven in ten users say the community is welcoming, although some outside of Europe and North America disagree.



SOURCE: Q41. Please indicate whether you agree or disagree with the following. (3-pt scale: agree, disagree, no opinion)

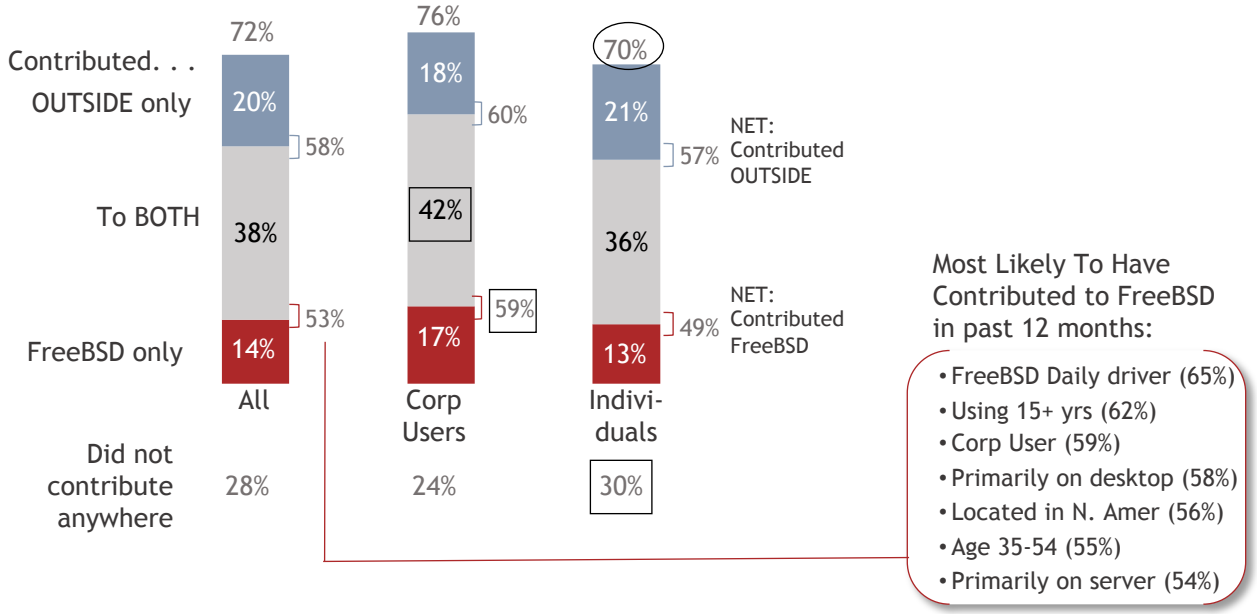
Contributing to FreeBSD

- Just over half have contributed to FreeBSD in the past 12 months - most of these have also contributed to other projects as well.
- The typical contributor has participated quarterly or less often and spends a few hours each time.
- The contribution experience has been generally positive, even if not highly so.
- Lack of clarity and confidence seem to be the main barriers to contributing, more so than bad experience or perceptions of an adverse community. A notable minority of non-committer/contributors are unsure how to get involved, or feel they are not qualified.
- A number of Commiters, most of whom have contributed in the past 12 months, take issue with the lack of clarity about whether/when code will be reviewed.
- There is unlikely to be a big uptick in participation in the coming year – but some segments do express an interest in participating. New users (< 5 years) are particularly likely to want to contribute more, but they are unsure how to and question their qualifications.

Level of Participation

- Just over half of respondents say they have contributed to FreeBSD in the past 12 months – and many of these contributed outside as well.
  - Those most likely to have contributed to FreeBSD include long-term users and those who see FreeBSD as their daily driver.
  - Individuals are more likely to have contributed outside of FreeBSD (57%) than within (49%), but many have not contributed anywhere (30%).

Past-12-Month Contribution Activity
(Among All Respondents)



SOURCE: Q36. Excluding FreeBSD, have you contributed to any Open Source software projects in the past 12 months? | Q37. In the past 12 months, have you contributed to FreeBSD (e.g. submitted a patch, opened a bug report, answered a newbie question)?

Level of Participation

- Most past-12-month contributors have participated quarterly or less often, and spend just a few hours at a time contributing to the projects.
  - Corporate Users don't contribute more frequently than Individuals, but they do spend more time at it when they do.

Frequency of Contributing to FreeBSD
(Among Those Who Have Contributed Past 12 Mos)

	All	Corp Users	Individuals
Weekly or more often	16%	19%	13%
At least monthly	22%	20%	24%
At least quarterly	24%	25%	24%
Less than quarterly	38%	37%	40%

Time Spent On Days Contribute
(Among Those Who Have Contributed Past 12 Mos)

	All	Corp Users	Individuals
< 1 hr	29%	26%	30%
1-<2 hrs	31%	29%	33%
2-<4 hrs	21%	18%	22%
4+hrs	16%	23%	12%

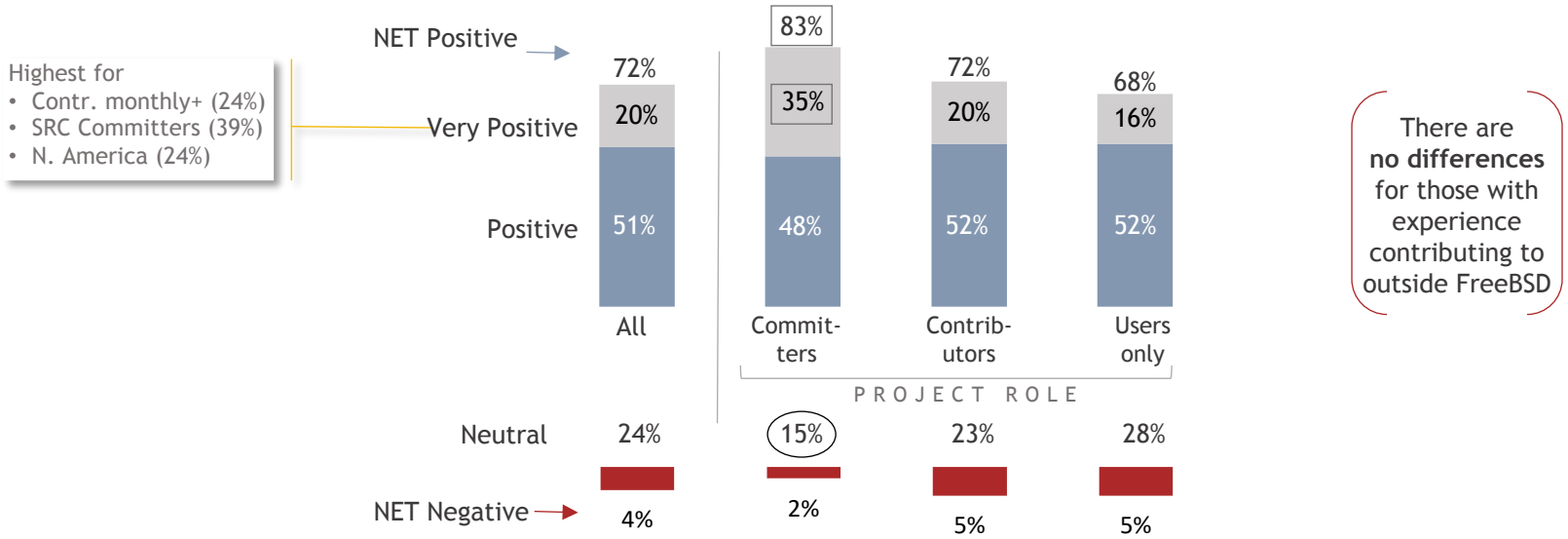
SOURCE: Q38. About how often have you made contributions to FreeBSD over the past 12 months? | Q39. On days when you contribute to FreeBSD, how about much time do you typically spend contributing?

The Contribution Experience

- Most of those who have contributed in the past 12 months are positive about the experience, even if not enthusiastically so.
  - Those most upbeat about the contribution experience are frequent contributors, SRC committers and those in North America.

Rating of Experience Contributing to FreeBSD

(Among Those Who Have Contributed Past 12 Mos)



There are **no differences** for those with experience contributing to outside FreeBSD

SOURCE: Q40. Please rate your experience contributing to FreeBSD. (5-pt scale: very negative to very positive)

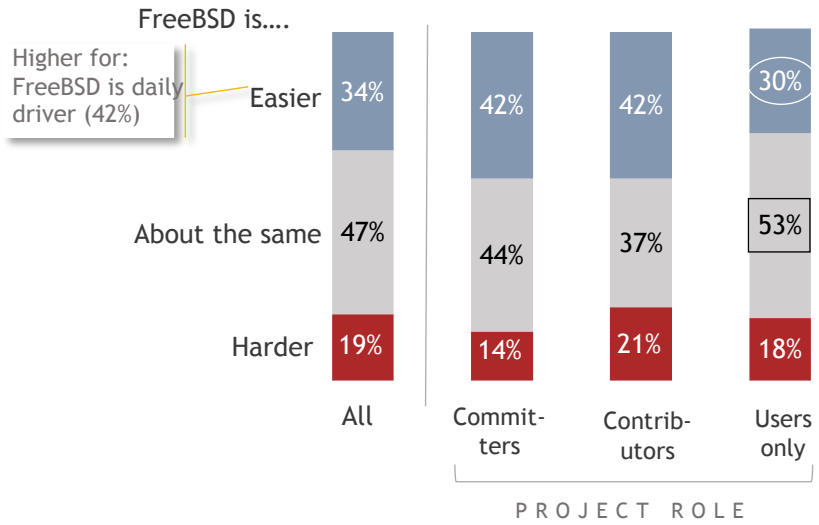
The Contribution Experience

- FreeBSD users generally believe FreeBSD's contribution process is the same as other open source projects'.
  - But perceptions of difficulty may be holding some users back: those who have contributed only outside the project are more likely than others to say that it is more difficult (and less easy) to contribute here.

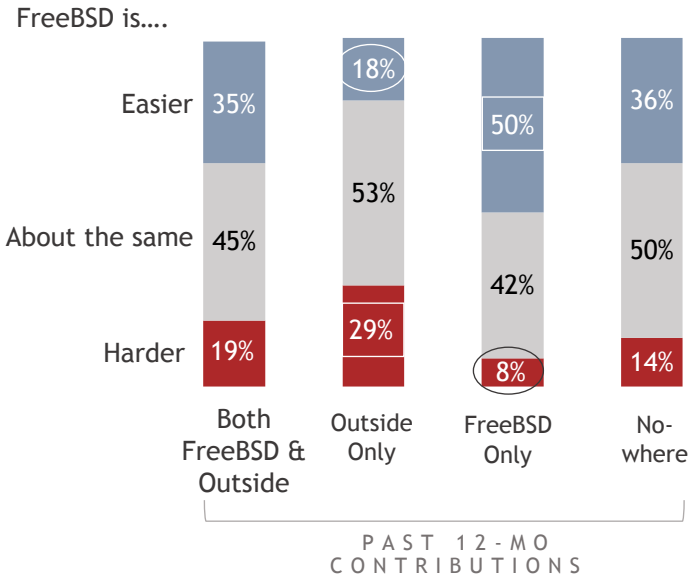
How FreeBSD Contribution Process Compares to Other Open-Source Projects

(Among Those Who Have An Opinion, Even if Haven't Contributed)

By Project Role



By Where Contributed in Past 12 mos



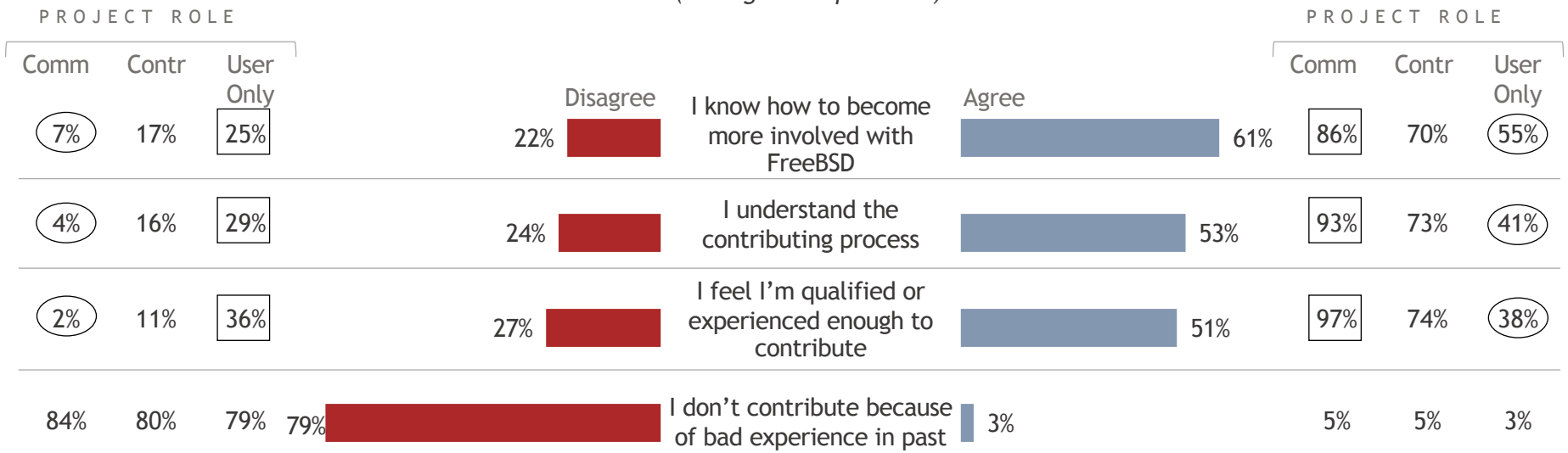
SOURCE: Q42. How does FreeBSD compare to other open source projects when it comes to contributing? Please answer even if you haven't contributed - basing your answer on how you think FreeBSD compares to others.

The Contribution Experience

- The main barrier to contributing appears to be lack of clarity more than having had a bad experience.
  - While many say they know how to contribute/get involved, many – especially those in a user-only role -- disagree.
  - A lack of confidence is also a major barrier to contributing.

Perceptions of FreeBSD Contribution Process – MAIN BARRIERS

(Among All Respondents)



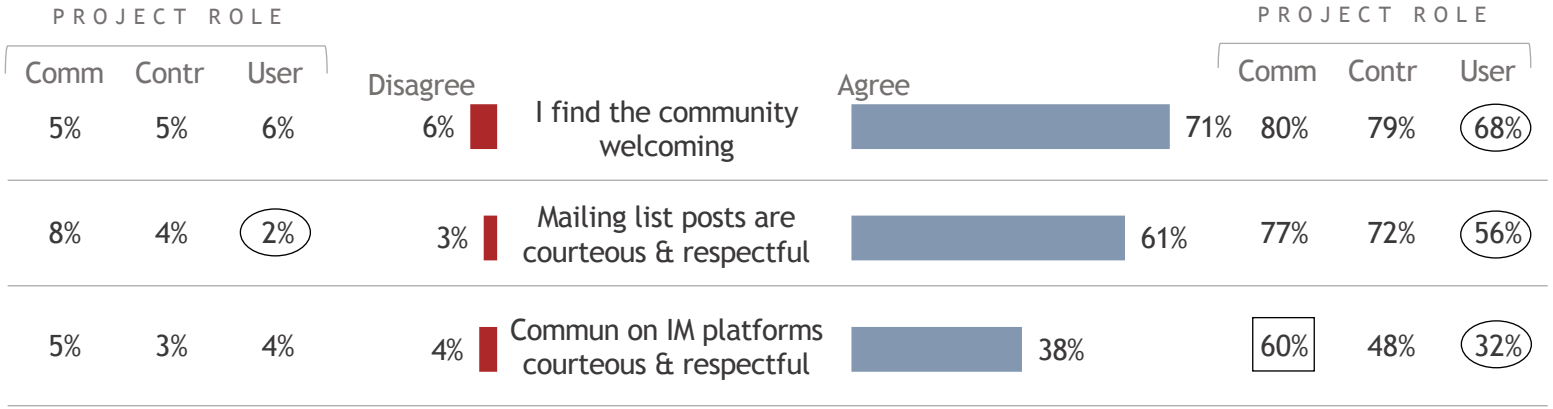
SOURCE: Q41. Please indicate whether you agree or disagree with the following. (3-pt scale: agree, disagree, no opinion)

The Contribution Experience

- A majority find the community welcoming and say communication is courteous and respectful.
  - Non-contributor/committers are less enthusiastic about the quality of communication, but this is largely because they are more neutral, not more negative.

Perceptions of FreeBSD Contribution Process - Community Communication

(Among All Respondents)



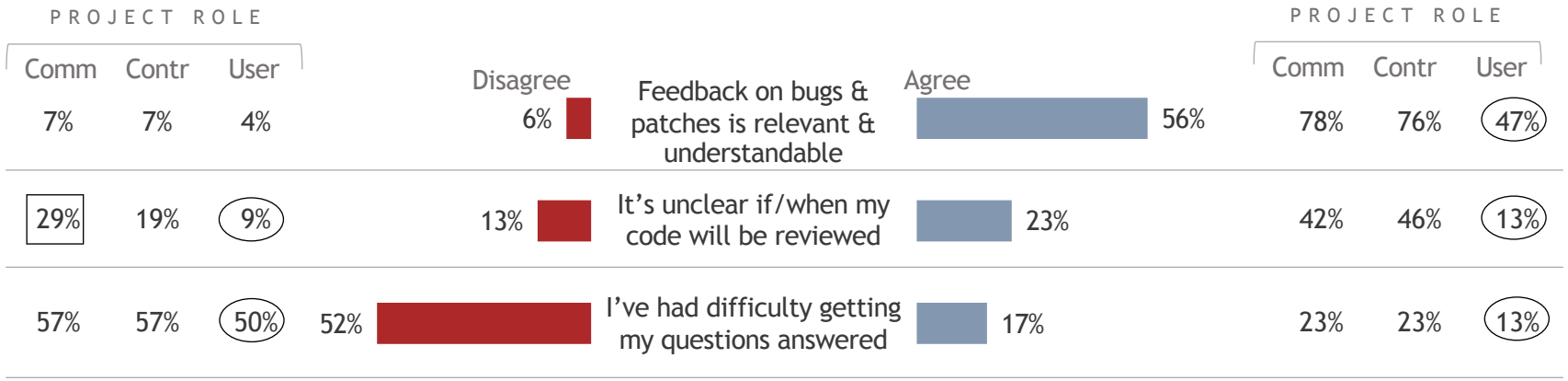
SOURCE: Q41. Please indicate whether you agree or disagree with the following. (3-pt scale: agree, disagree, no opinion)

The Contribution Experience

- Feedback on bugs and patches is relevant and understandable, but there is some concern – especially among committers – about lack of clarity as to if/when code will be reviewed.
  - A small but notable minority of committers/contributors say they have had difficulty getting questions answered.
  - As before, users-only are less enthusiastic, but are no more negative on this issues – most likely because of lack of experience with the process.

Other Perceptions of FreeBSD Contribution Process

(Among All Respondents)



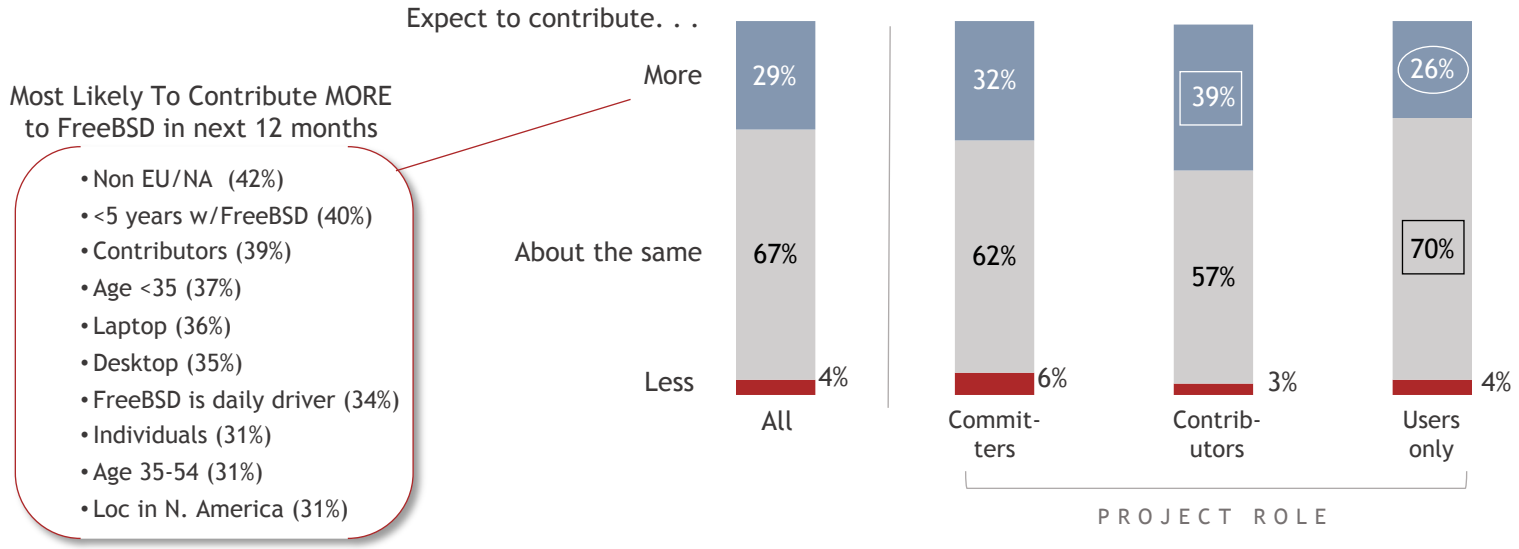
SOURCE: Q41. Please indicate whether you agree or disagree with the following. (3-pt scale: agree, disagree, no opinion)

Expected Future Contribution

- There is unlikely to be a big change in the level of involvement in the coming year, although some segments do show a greater propensity to increase their contribution level – especially outside of EU/NA, and among newer users.
  - Those in a Contributor role are more likely to increase their involvement (39%) than users are to begin contributing (26%).

Expected Change in Contribution to FreeBSD Over Next 12 Months

(Among All Respondents)



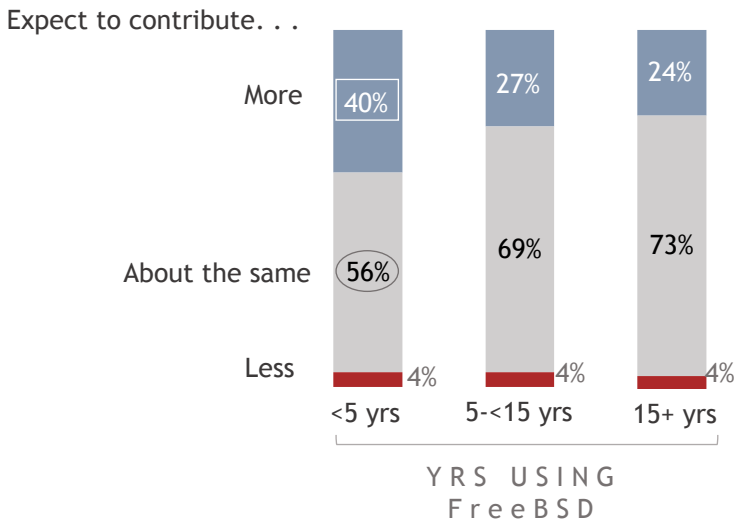
SOURCE: Q43. Over the next 12 months, do you expect you will contribute more, less or about the same to FreeBSD project? (3-point scale)

Expected Future Contribution

- Newer FreeBSD users want to contribute more, but they are not as clear as others on the process and question their qualifications. They are more open than others to paid training around how to contribute.
  - Unlike their more experienced peers, new users expect the contribution process at FreeBSD is more difficult than elsewhere.

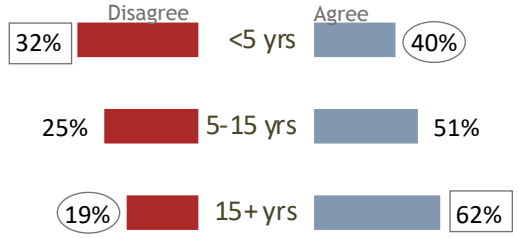
Expected Change in Contribution to FreeBSD

(By Years Using FreeBSD)

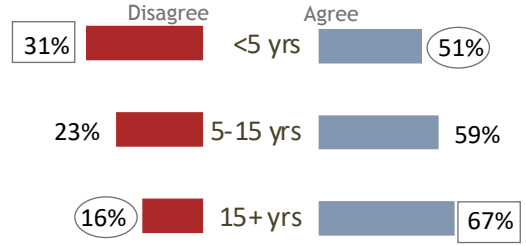


38% of new users are interested in **paid training** on "how to contribute" vs. 28% for longer term users

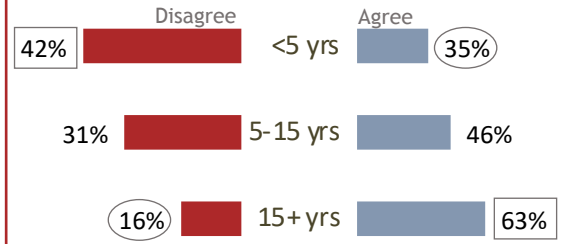
I understand contributing process



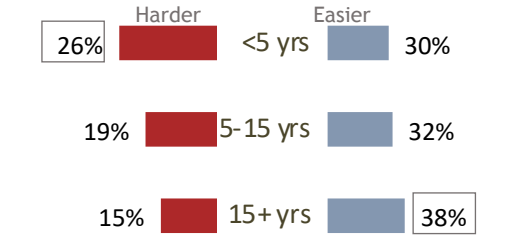
I know how to become more involved



I feel qualified/experienced enough



How Contributing to FreeBSD compares



SOURCE: Q43. Over the next 12 months, do you expect you will contribute more, less or about the same to FreeBSD project? (3-point scale) | Q41. Please indicate whether you agree or disagree with the following. (3-pt scale: agree, disagree, no opinion)

FreeBSD Foundation

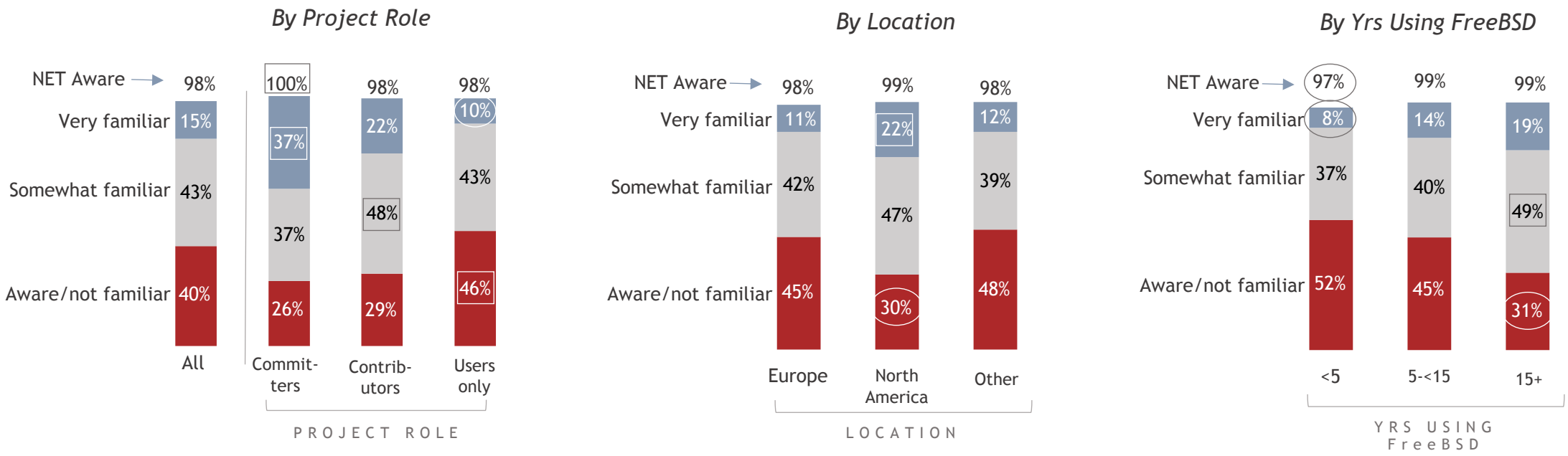
- There is near universal *awareness* of the FreeBSD Foundation, but outside of Committers, *familiarity* is low.
- Most see the Foundation's main function as one around advocacy and legal representation.
- There is little consensus on what the community would like the Foundation to focus on over the coming year, but among the most widely mentioned are: recruitment, education/ documentation, and improving Wi-Fi drivers.
- There appears to be some appetite for paid education offered through the Foundation, but interest varies considerably by segment, so one-size will not fit all here.

Foundation: Familiarity & Awareness

- Nearly all users have heard of the FreeBSD Foundation, but relatively few are highly familiar outside of Committers.
  - Users-only, those outside EU/NA and newer users are generally aware of, but not familiar with, the Foundation.

Familiarity with FreeBSD Foundation

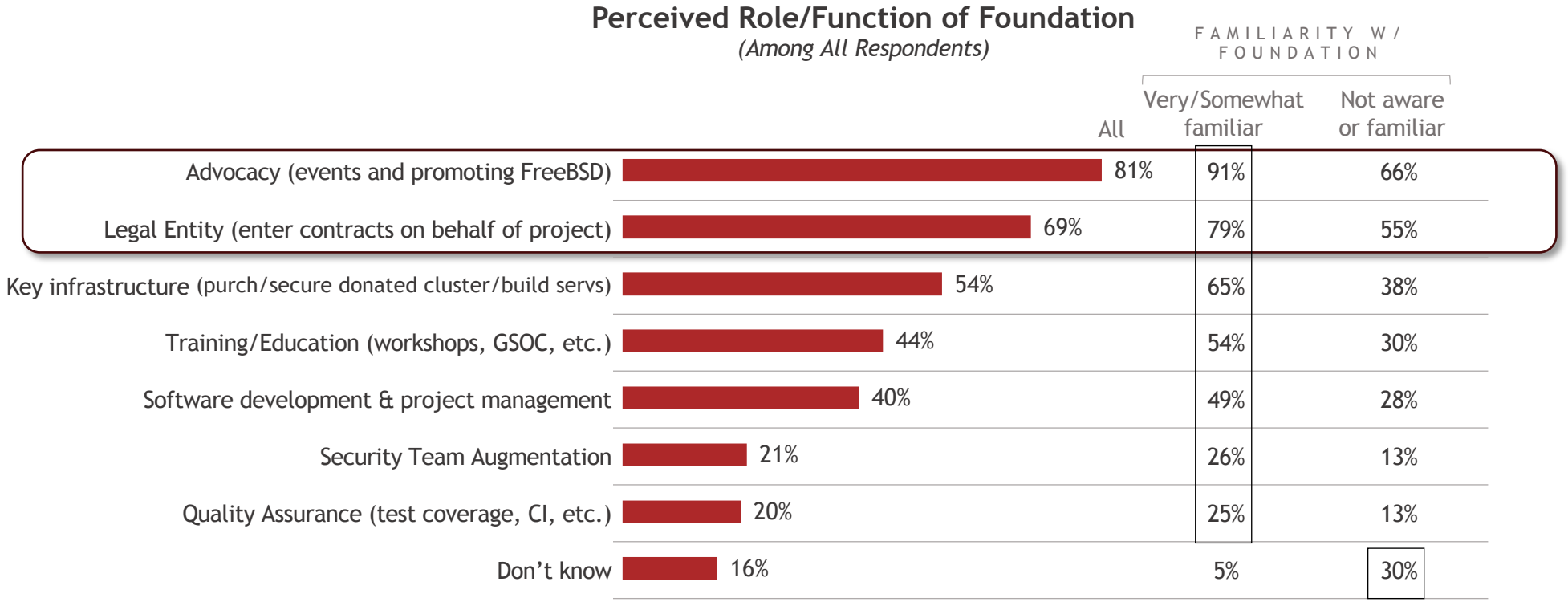
(Among All Respondents)



SOURCE: Q49. To what extent, if at all, are you familiar with the "FreeBSD Foundation"? (4-pt scale)

Foundation: Perceived Role/Function

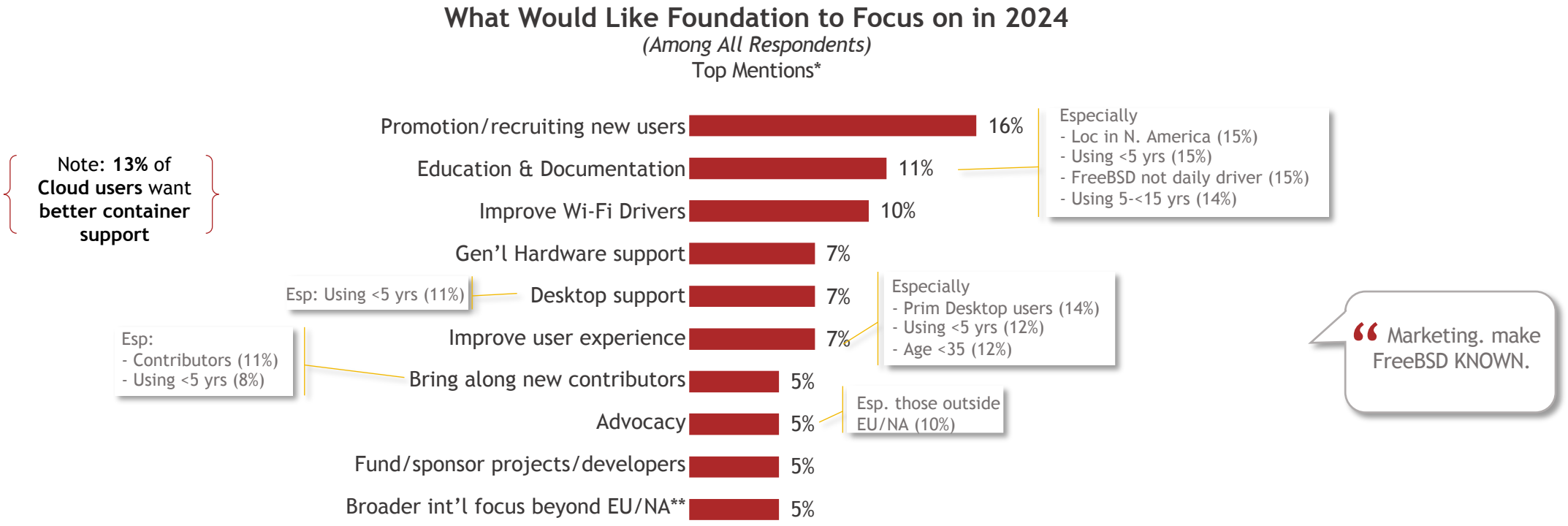
- The community sees the Foundation's role as primarily one of advocacy and legal action.
  - Quality assurance and security team augmentation are lesser-known Foundation functions, even among those familiar.



SOURCE: Q50. As far as you know, which of the following functions or roles does the FreeBSD Foundation serve? (Check all that apply)

Foundation: Preferred Focus

- There is not widespread agreement among respondents as to what they would like the Foundation to focus on for the coming year.
  - Top of the list are: recruiting new users, education and documentation, and improving Wi-Fi drivers. Primarily-cloud users would also like to see better container support.



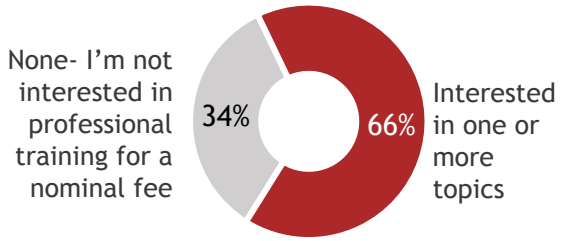
*Coded response to open ended question **Among those outside EU/NA*

SOURCE: Q52. The mission of the FreeBSD Foundation is to support and promote the FreeBSD Project and community worldwide… Given this, what TWO THINGS would you most like to see the Foundation focus on for the coming year? (open end)

Foundation: Interest in Paid Training

- There is widespread interest in paid professional training classes through the Foundation.
  - Topics around Kernel Internals and FreeBSD for Linux System Administrators are most widely appealing, but interest varies considerably based on subgroup.

Interest in Paid Professional Training Classes
(Among All Respondents)



39% KERNEL INTERNALS

Especially among:
- Role: Contributors (50%)
- Age <35 (45%)
- Role: Committers (44%)
- Age 35-54 (40%)

35% FreeBSD FOR LINUX SYSADMINS
- Prim. on Storage App (56%)
- Prim. On Network App (53%)
- Prim. on cloud (48%)
- Age < 35 (44%)
- Using FreeBSD < 5 years (41%)
- Non-daily driver (40%)
- 35-54 (37%)

32% HOW TO BECOME FreeBSD KERNEL DEVEL
- Role: Contributors (43%)
- Role: Committers (42%)
- Contr monthly+ (40%)
- Prim. on laptop (38%)
- Loc outside EU/NA (37%)
- Loc in N. America (36%)
- Using < 5 yrs (35%)

31% HOW TO CONTRIBUTE TO THE PROJECT
- Contributors (40%)
- Age <35 (39%)
- Using FreeBSD <5 yrs (38%)
- Loc in N. America (35%)

26% INTRO TO FreeBSD
- Using FreeBSD <5 yrs (36%)
- Age <35 (34%)
- Non-daily driver (28%)
- User only (28%)
- Contr qtrly or less (28%)

SOURCE: Q51. If the FreeBSD Foundation were to offer professional training classes for a nominal fee, what topics would you like to see? (Check all that apply)