

# Virginia Tech IT Security Lab

*Host Inventory Control Survey*

October 30th 2017, 12:18 pm EDT

This survey is part of research being conducted by the Virginia Tech IT Security Lab to better understand host inventory controls utilized in networks of higher education institutions.

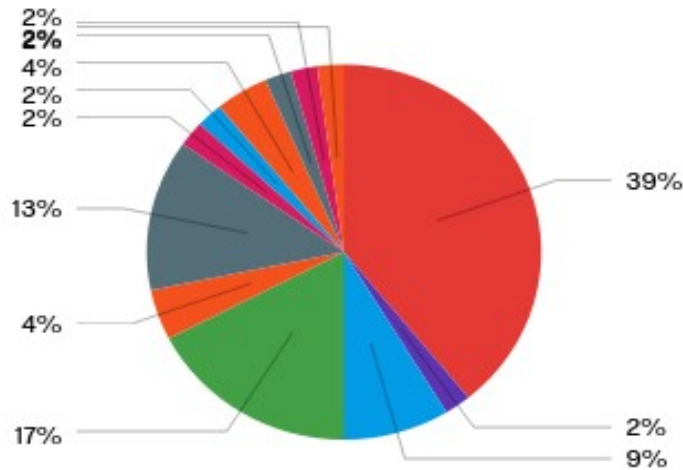
The motivation was to determine what challenges higher education institutions face with implementing the first CIS Critical Security Control (previously known as the SANS Top 20 Critical Security Controls). The key principle of CSC #1 is, "actively manage (inventory, track, and correct) all hardware devices on the network so that only authorized devices are given access, and unauthorized and unmanaged devices are found and prevented from gaining access." Implementing this control helps identify the owner and location of a machine which is a target or source of an attack.

The intended respondent was someone with broad knowledge of an institution's network and security controls such as a CIO, CISO, or their designee. Additionally, the intended respondent was at the institution rather than system level, if applicable. For the purposes of this survey, a host is defined as anything which communicates on a network which the institution controls.

These results cover 52 responses for the survey which was available May 24, 2017 until September 22, 2017.

This PDF file is available at the Virginia Tech IT Security Lab website ([https://security.vt.edu/about/security\\_lab.html](https://security.vt.edu/about/security_lab.html)).

What is your institution's Basic Carnegie Classification? Look up your institution here:  
<http://carnegieclassifications.iu.edu/lookup/lookup.php>



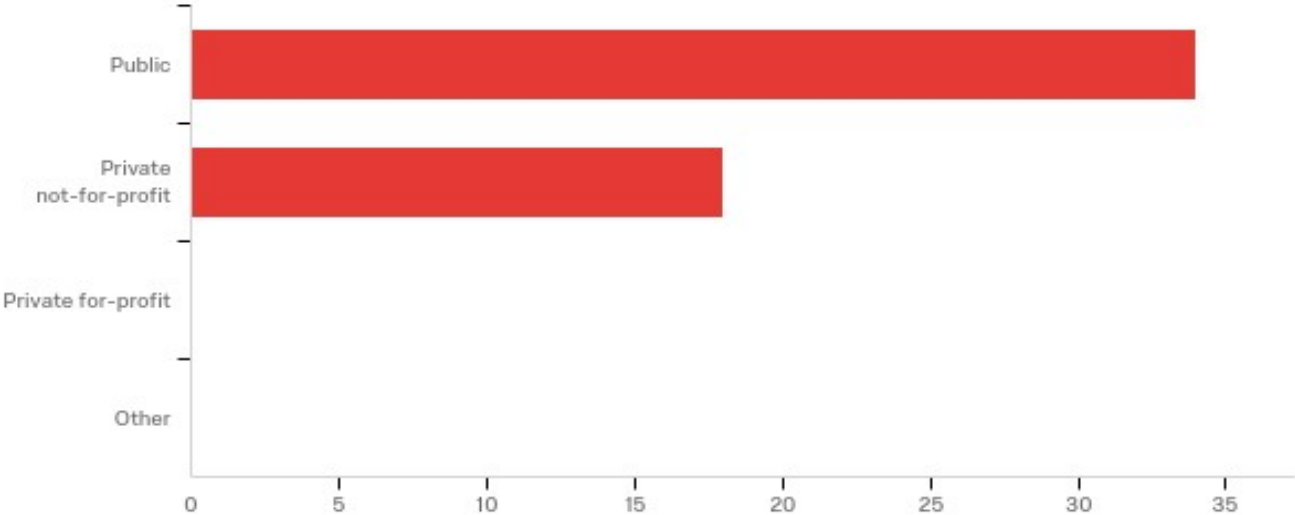
- R1: Doctoral Universities: Highest Research Activity
- R2: Doctoral Universities: Higher Research Activity
- R3: Doctoral Universities: Moderate Research Activity
- M1: Master's Colleges & Universities: Larger Programs
- M2: Master's Colleges & Universities: Medium Programs
- Baccalaureate Colleges: Arts & Sciences Focus     ■ Baccalaureate Colleges: Diverse Fields
- Associate's Colleges: High Transfer-High Traditional
- Associate's Colleges: Mixed Transfer/Career & Technical-High Traditional
- Associate's Colleges: Mixed Transfer/Career & Technical-Mixed Traditional/Nontraditional
- Associate's Colleges: Mixed Transfer/Career & Technical-High Nontraditional
- Special Focus Four-Year: Arts, Music & Design Schools

#	Answer	Count
1	R1: Doctoral Universities: Highest Research Activity	18

2	R2: Doctoral Universities: Higher Research Activity	1
3	R3: Doctoral Universities: Moderate Research Activity	4
4	M1: Master's Colleges & Universities: Larger Programs	8
5	M2: Master's Colleges & Universities: Medium Programs	2
6	M3: Master's Colleges & Universities: Small Programs	0
7	Baccalaureate Colleges: Arts & Sciences Focus	6
8	Baccalaureate Colleges: Diverse Fields	1
9	Baccalaureate/Associate's Colleges: Mixed Baccalaureate/Associate's	0
10	Baccalaureate/Associate's Colleges: Associate's Dominant	0
11	Associate's Colleges: High Transfer-High Traditional	1
12	Associate's Colleges: High Transfer-Mixed Traditional/Nontraditional	0
13	Associate's Colleges: High Transfer-High Nontraditional	0
14	Associate's Colleges: Mixed Transfer/Career & Technical-High Traditional	2
15	Associate's Colleges: Mixed Transfer/Career & Technical-Mixed Traditional/Nontraditional	1
16	Associate's Colleges: Mixed Transfer/Career & Technical-High Nontraditional	1
17	Associate's Colleges: High Career & Technical-High Traditional	0
18	Associate's Colleges: High Career & Technical-Mixed Traditional/Nontraditional	0
19	Associate's Colleges: High Career & Technical-High Nontraditional	0
20	Special Focus Two-Year: Health Professions	0
21	Special Focus Two-Year: Technical Professions	0
22	Special Focus Two-Year: Arts & Design	0
23	Special Focus Two-Year: Other Fields	0
24	Special Focus Four-Year: Faith-Related Institutions	0
25	Special Focus Four-Year: Medical Schools & Centers	0

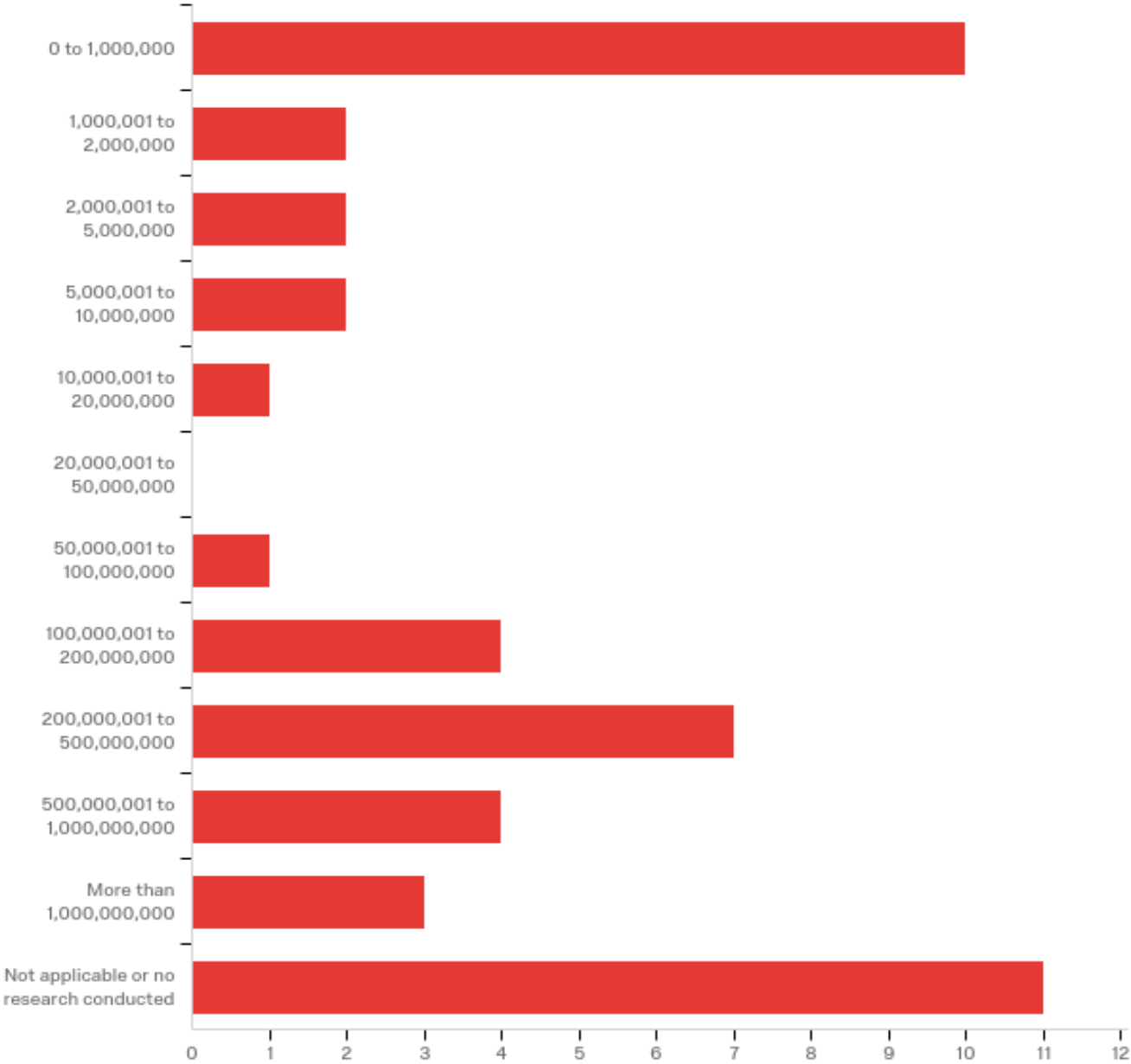
26	Special Focus Four-Year: Other Health Professions Schools	0
27	Special Focus Four-Year: Engineering Schools	0
28	Special Focus Four-Year: Other Technology-Related Schools	0
29	Special Focus Four-Year: Business & Management Schools	0
30	Special Focus Four-Year: Arts, Music & Design Schools	1
31	Special Focus Four-Year: Law Schools	0
32	Special Focus Four-Year: Other Special Focus Institutions	0
33	Tribal Colleges	0
	Total	46

# How is your institution controlled?



#	Answer	%	Count
1	Public	65.38%	34
2	Private not-for-profit	34.62%	18
3	Private for-profit	0.00%	0
4	Other	0.00%	0
	Total	100%	52

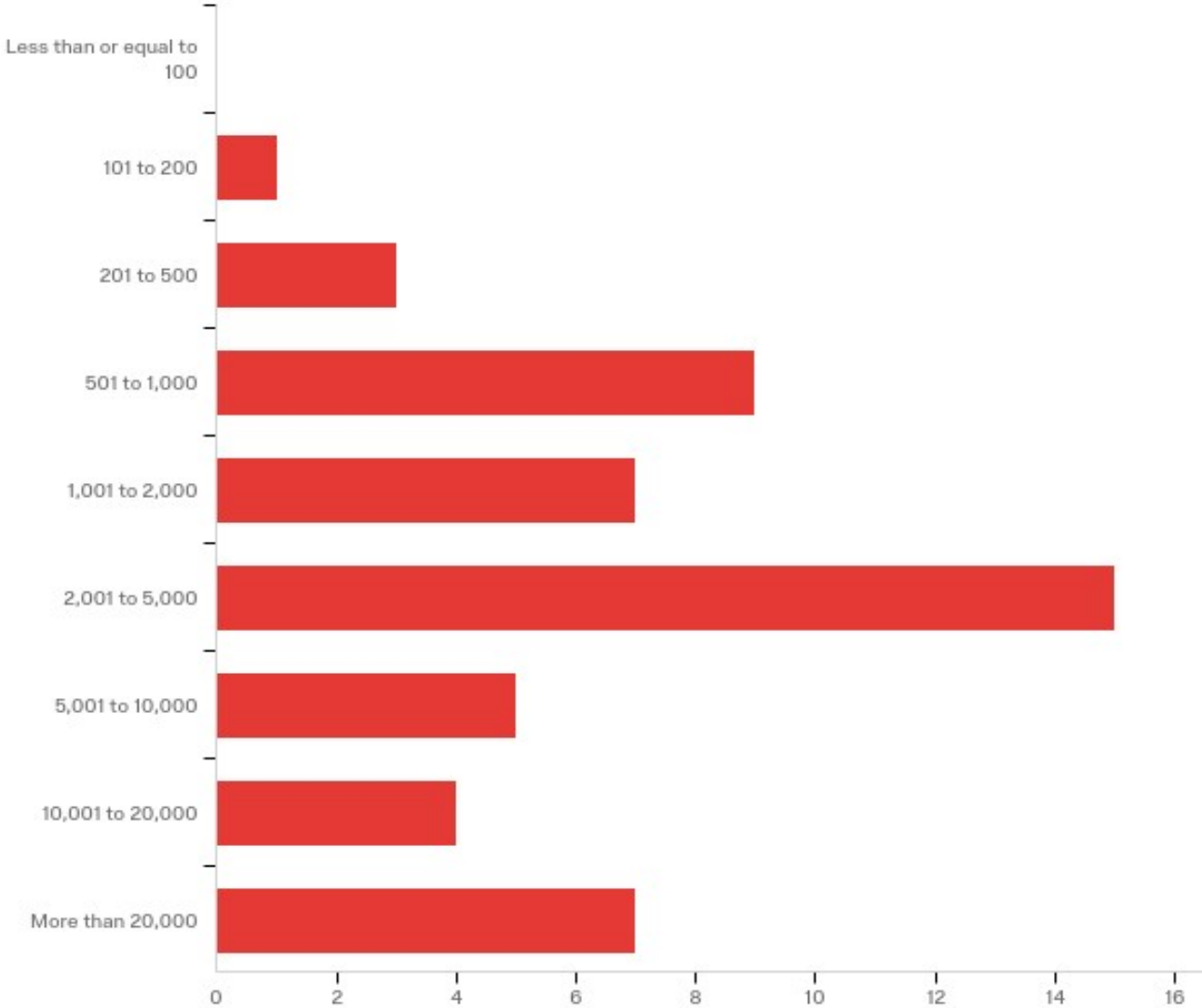
# How much does your institution expend on research annually in dollars?



#	Answer	%	Count
1	0 to 1,000,000	21.28%	10
2	1,000,001 to 2,000,000	4.26%	2
3	2,000,001 to 5,000,000	4.26%	2
4	5,000,001 to 10,000,000	4.26%	2
5	10,000,001 to 20,000,000	2.13%	1
6	20,000,001 to 50,000,000	0.00%	0

7	50,000,001 to 100,000,000	2.13%	1
8	100,000,001 to 200,000,000	8.51%	4
9	200,000,001 to 500,000,000	14.89%	7
10	500,000,001 to 1,000,000,000	8.51%	4
11	More than 1,000,000,000	6.38%	3
12	Not applicable or no research conducted	23.40%	11
	Total	100%	47

# How many employees work at your institution?

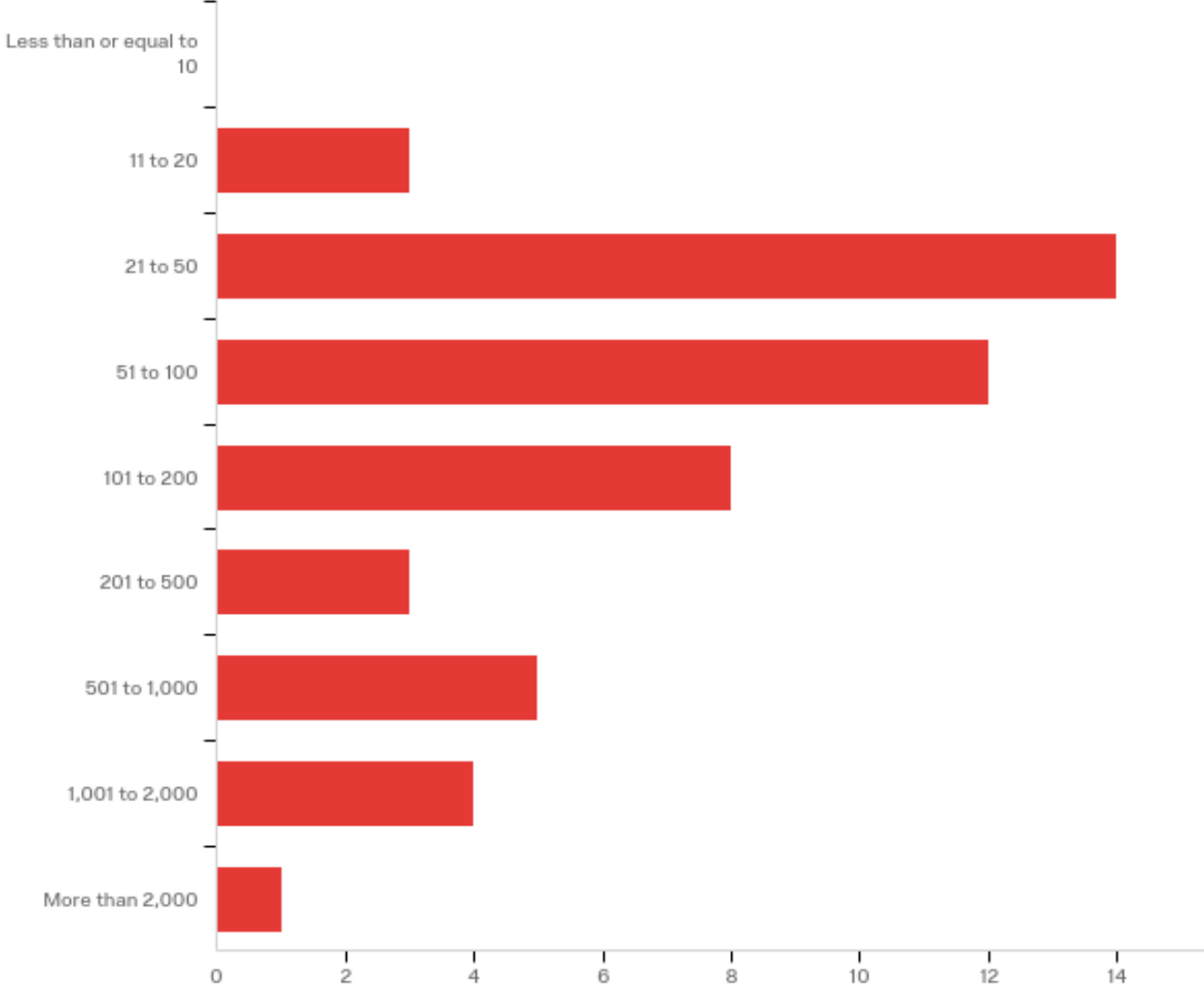


#	Answer	%	Count
1	Less than or equal to 100	0.00%	0
2	101 to 200	1.96%	1
3	201 to 500	5.88%	3
4	501 to 1,000	17.65%	9
5	1,001 to 2,000	13.73%	7
6	2,001 to 5,000	29.41%	15
7	5,001 to 10,000	9.80%	5
8	10,001 to 20,000	7.84%	4



9	More than 20,000	13.73%	7
	Total	100%	51

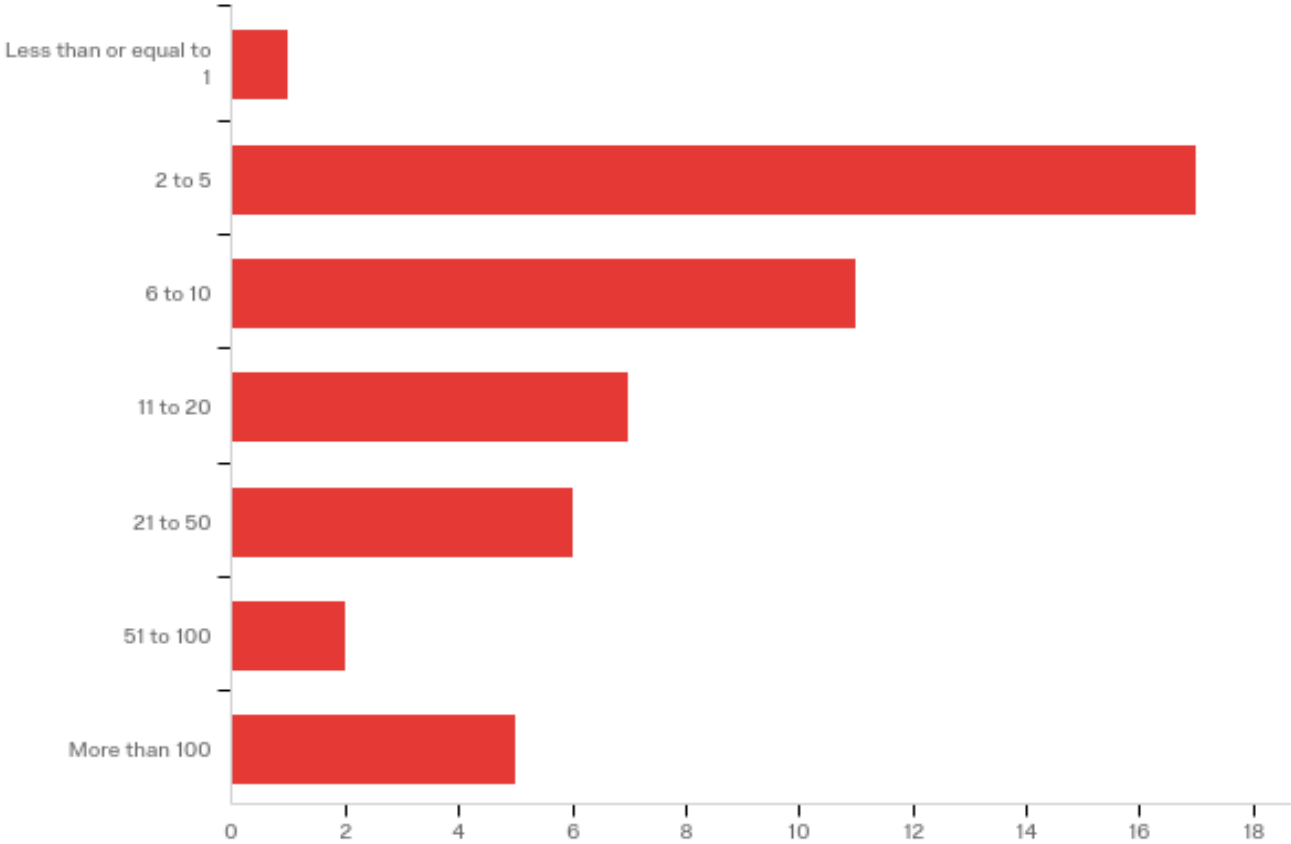
# How many employees at your institution spend most of their time in Information Technology roles?



#	Answer	%	Count
1	Less than or equal to 10	0.00%	0
2	11 to 20	6.00%	3
3	21 to 50	28.00%	14
4	51 to 100	24.00%	12
5	101 to 200	16.00%	8
6	201 to 500	6.00%	3
7	501 to 1,000	10.00%	5
8	1,001 to 2,000	8.00%	4

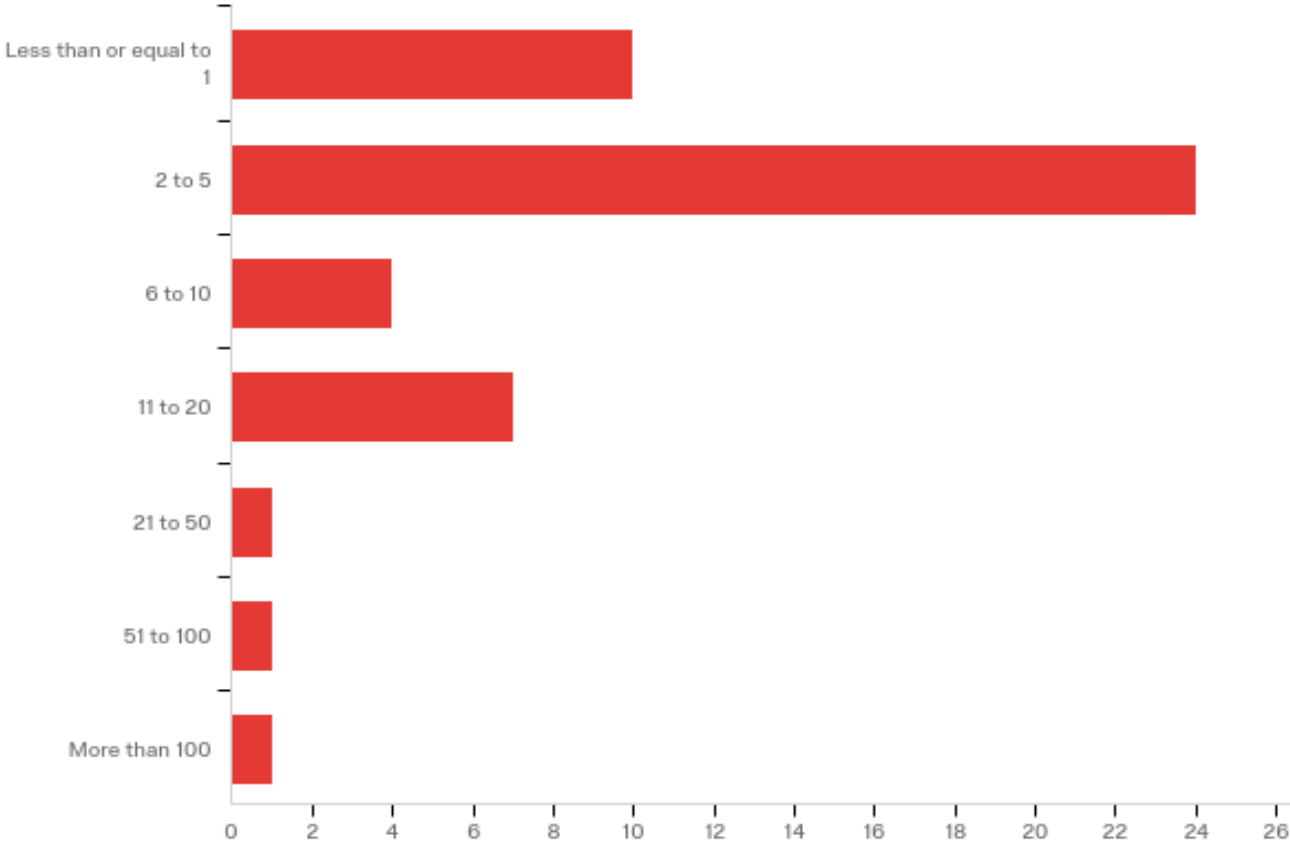
9	More than 2,000	2.00%	1
	Total	100%	50

**Of those employees in Information Technology roles, how many are involved in network architecture, engineering, and operations?**



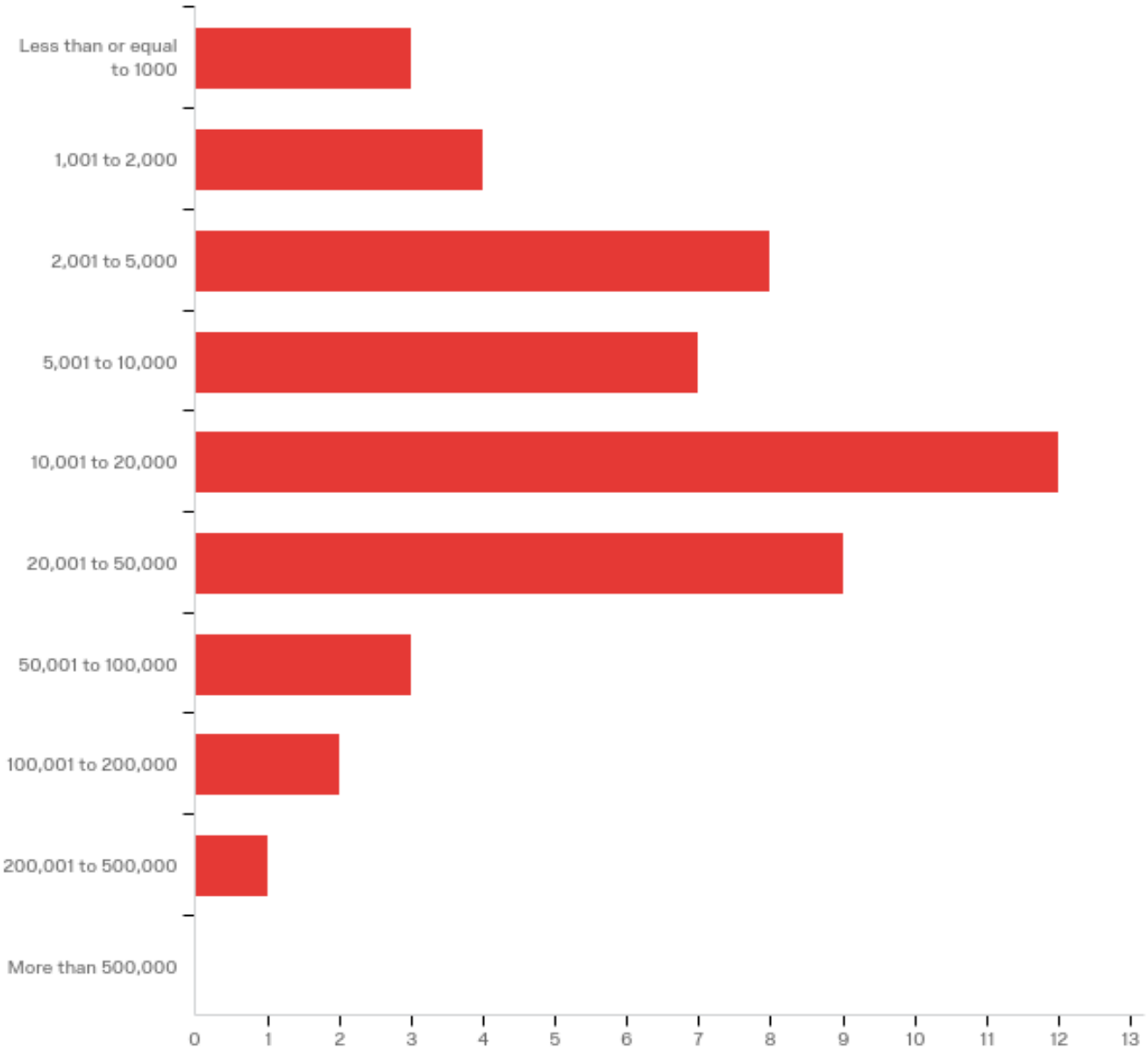
#	Answer	%	Count
1	Less than or equal to 1	2.04%	1
2	2 to 5	34.69%	17
3	6 to 10	22.45%	11
4	11 to 20	14.29%	7
5	21 to 50	12.24%	6
6	51 to 100	4.08%	2
7	More than 100	10.20%	5
	Total	100%	49

**Of those employees in Information Technology roles, how many are involved in information security architecture, engineering, and operations?**



#	Answer	%	Count
1	Less than or equal to 1	20.83%	10
2	2 to 5	50.00%	24
3	6 to 10	8.33%	4
4	11 to 20	14.58%	7
5	21 to 50	2.08%	1
6	51 to 100	2.08%	1
7	More than 100	2.08%	1
	Total	100%	48

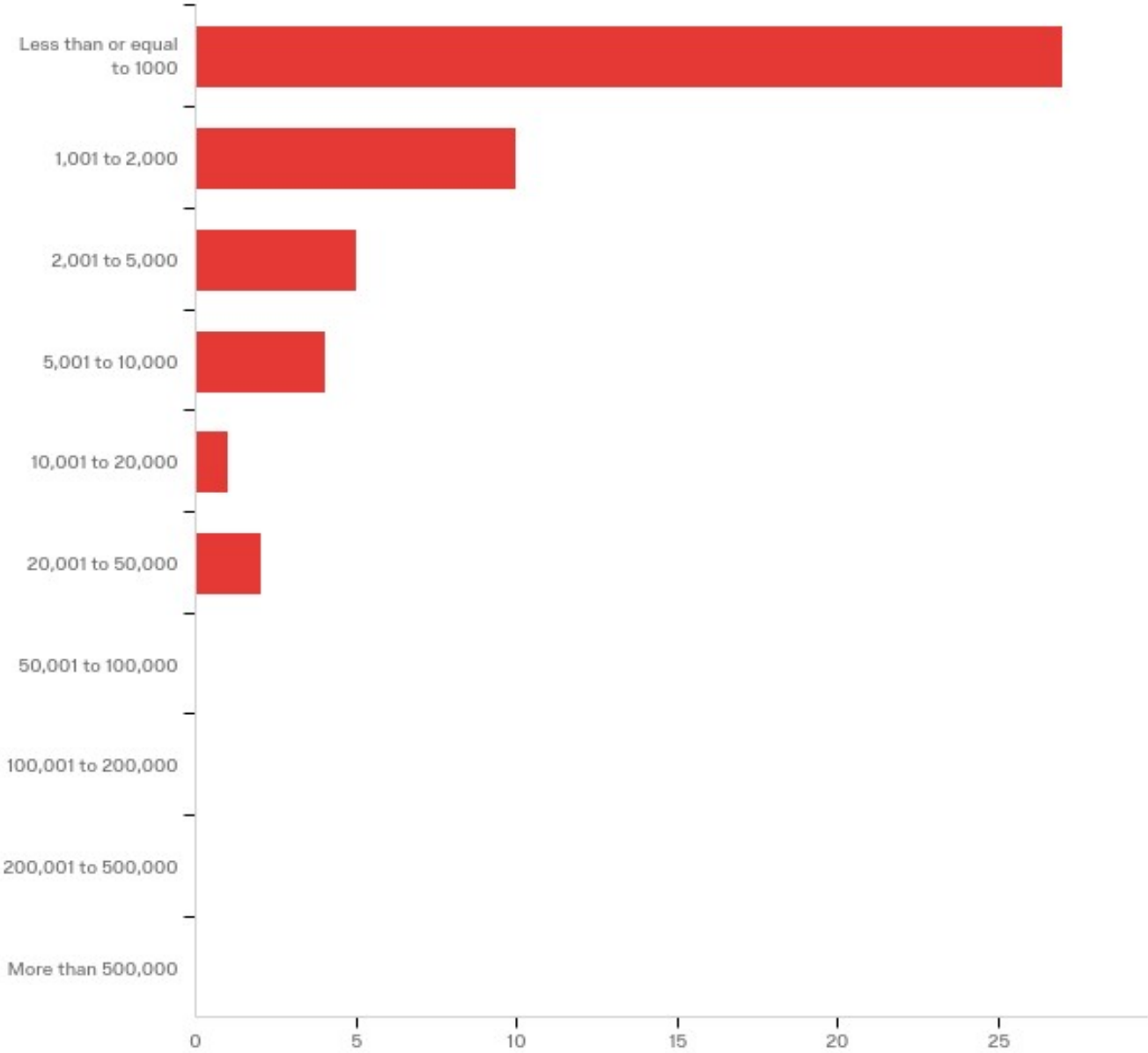
# How large is your enrolled student population?



#	Answer	%	Count
1	Less than or equal to 1000	6.12%	3
2	1,001 to 2,000	8.16%	4
3	2,001 to 5,000	16.33%	8
4	5,001 to 10,000	14.29%	7
5	10,001 to 20,000	24.49%	12
6	20,001 to 50,000	18.37%	9

7	50,001 to 100,000	6.12%	3
8	100,001 to 200,000	4.08%	2
9	200,001 to 500,000	2.04%	1
10	More than 500,000	0.00%	0
	Total	100%	49

# How many of your enrolled students are considered remote?

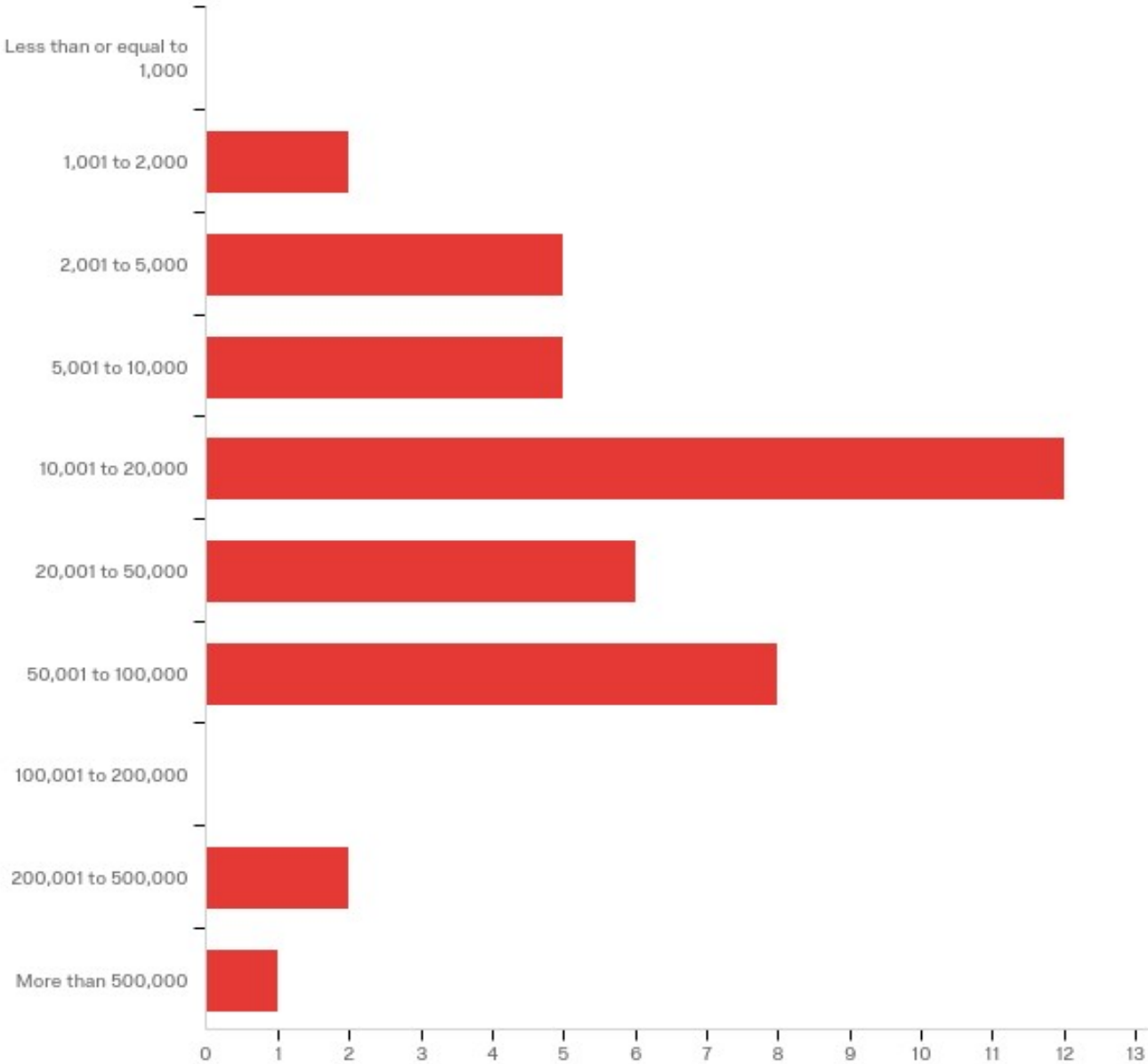


#	Answer	%	Count
1	Less than or equal to 1000	55.10%	27
2	1,001 to 2,000	20.41%	10
3	2,001 to 5,000	10.20%	5
4	5,001 to 10,000	8.16%	4
5	10,001 to 20,000	2.04%	1
6	20,001 to 50,000	4.08%	2



7	50,001 to 100,000	0.00%	0
8	100,001 to 200,000	0.00%	0
9	200,001 to 500,000	0.00%	0
10	More than 500,000	0.00%	0
	Total	100%	49

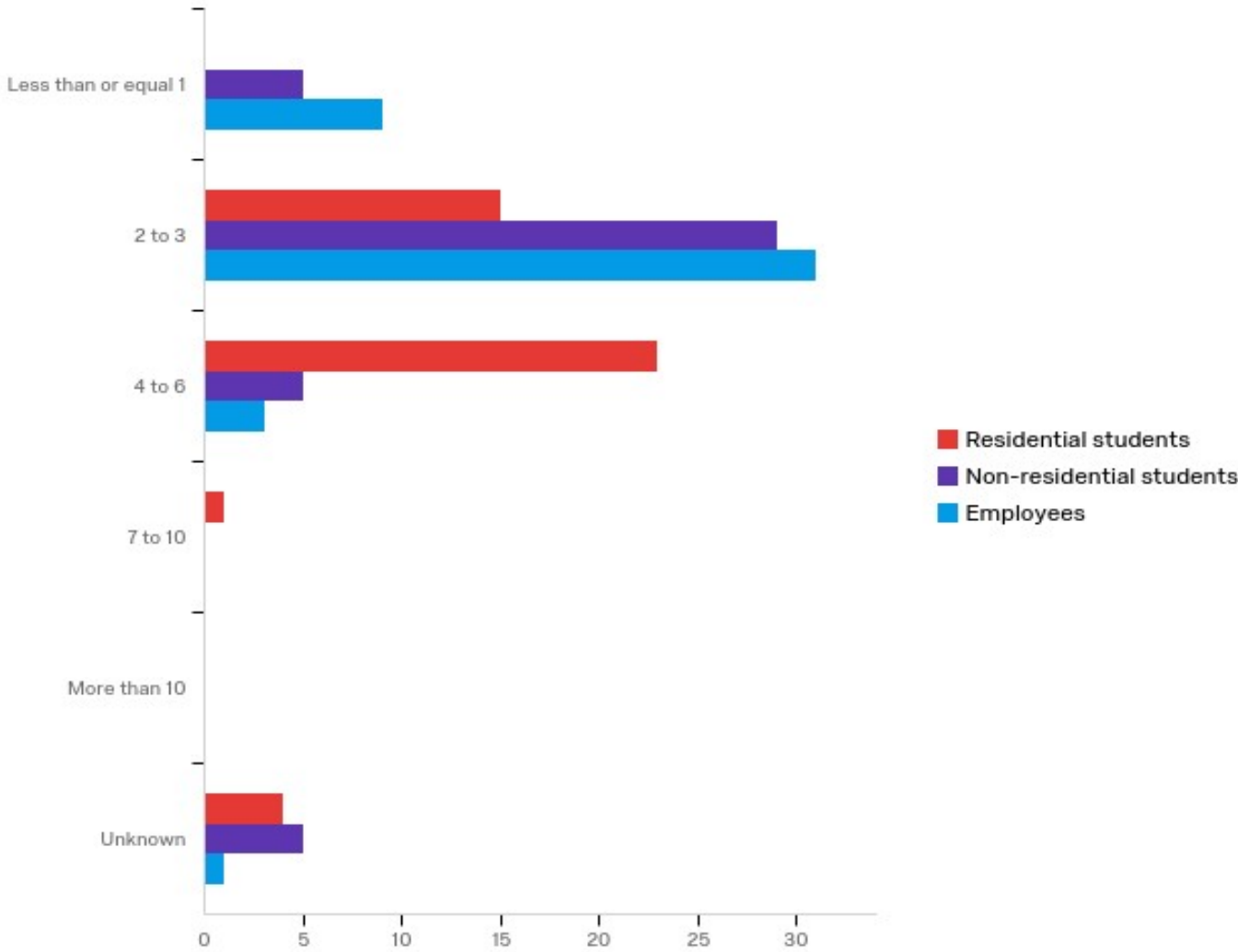
What is your best estimate for the peak number of hosts on your network at one time? Include physical and virtual machines, embedded devices, IoT, BYOD, wired, and wireless.



#	Answer	%	Count
1	Less than or equal to 1,000	0%	0
2	1,001 to 2,000	5%	2
3	2,001 to 5,000	12%	5
4	5,001 to 10,000	12%	5
5	10,001 to 20,000	28%	12

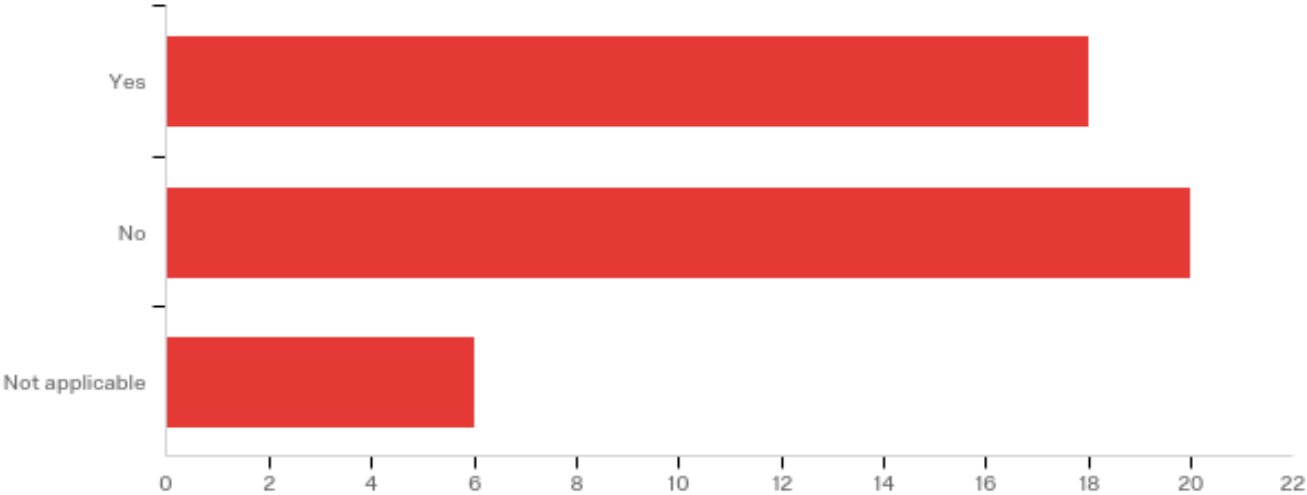
6	20,001 to 50,000	14%	6
7	50,001 to 100,000	19%	8
8	100,001 to 200,000	0%	0
9	200,001 to 500,000	5%	2
10	More than 500,000	2%	1
11	Unknown	5%	2
	Total	100%	43

# What is the average number of BYOD hosts each type of end-user connects to your network?



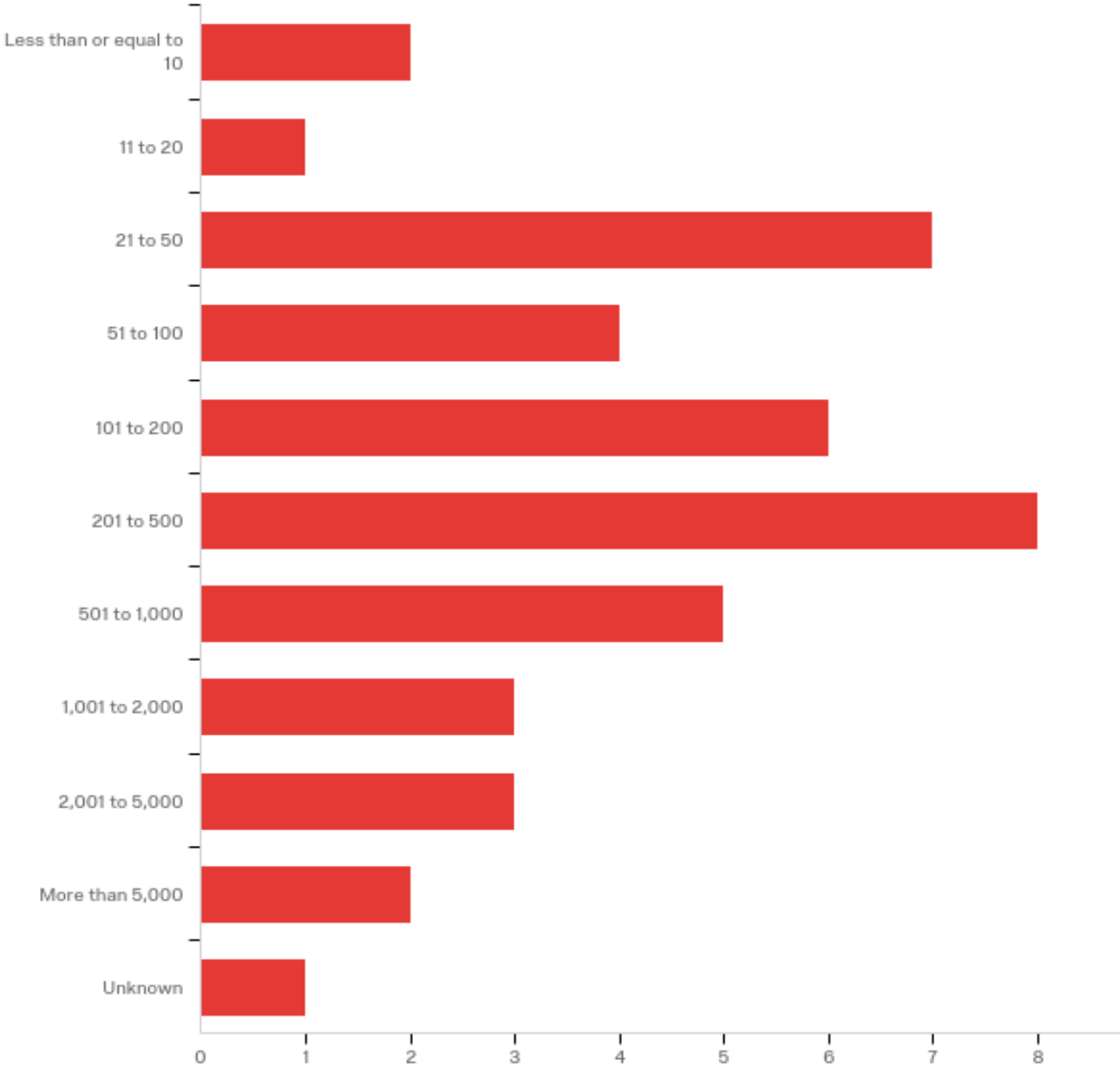
#	Question	Less than or equal 1	2 to 3	4 to 6	7 to 10	More than 10	Unknown	Total
1	Residential students	0	15	23	1	0	4	43
2	Non-residential students	5	29	5	0	0	5	44
3	Employees	9	31	3	0	0	1	44

**For your remote students, are they permitted to connect to the network via VPN?**



#	Answer	%	Count
7	Yes	40.91%	18
1	No	45.45%	20
2	Not applicable	13.64%	6
	Total	100%	44

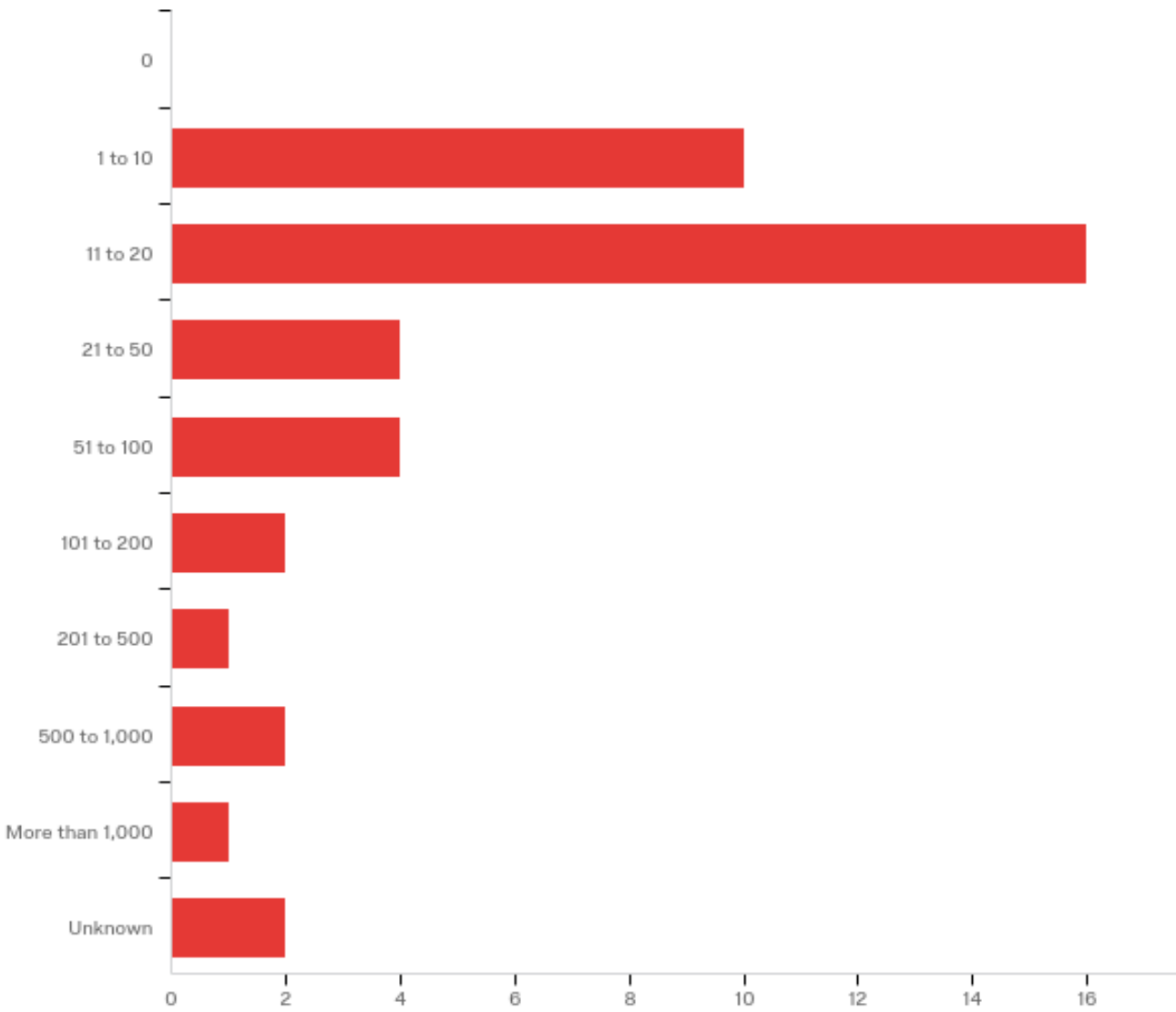
**What is your best estimate for the number of sub-networks (Local Area Network segments or broadcast domains)?**



#	Answer	%	Count
1	Less than or equal to 10	4.76%	2
2	11 to 20	2.38%	1
3	21 to 50	16.67%	7
4	51 to 100	9.52%	4
5	101 to 200	14.29%	6

6	201 to 500	19.05%	8
7	501 to 1,000	11.90%	5
8	1,001 to 2,000	7.14%	3
9	2,001 to 5,000	7.14%	3
10	More than 5,000	4.76%	2
11	Unknown	2.38%	1
	Total	100%	42

How many logical network zones or groups do you have in your network? Examples include Voice over IP, residential networks, Personally Identifiable Information, Payment Card Industry, and data centers.

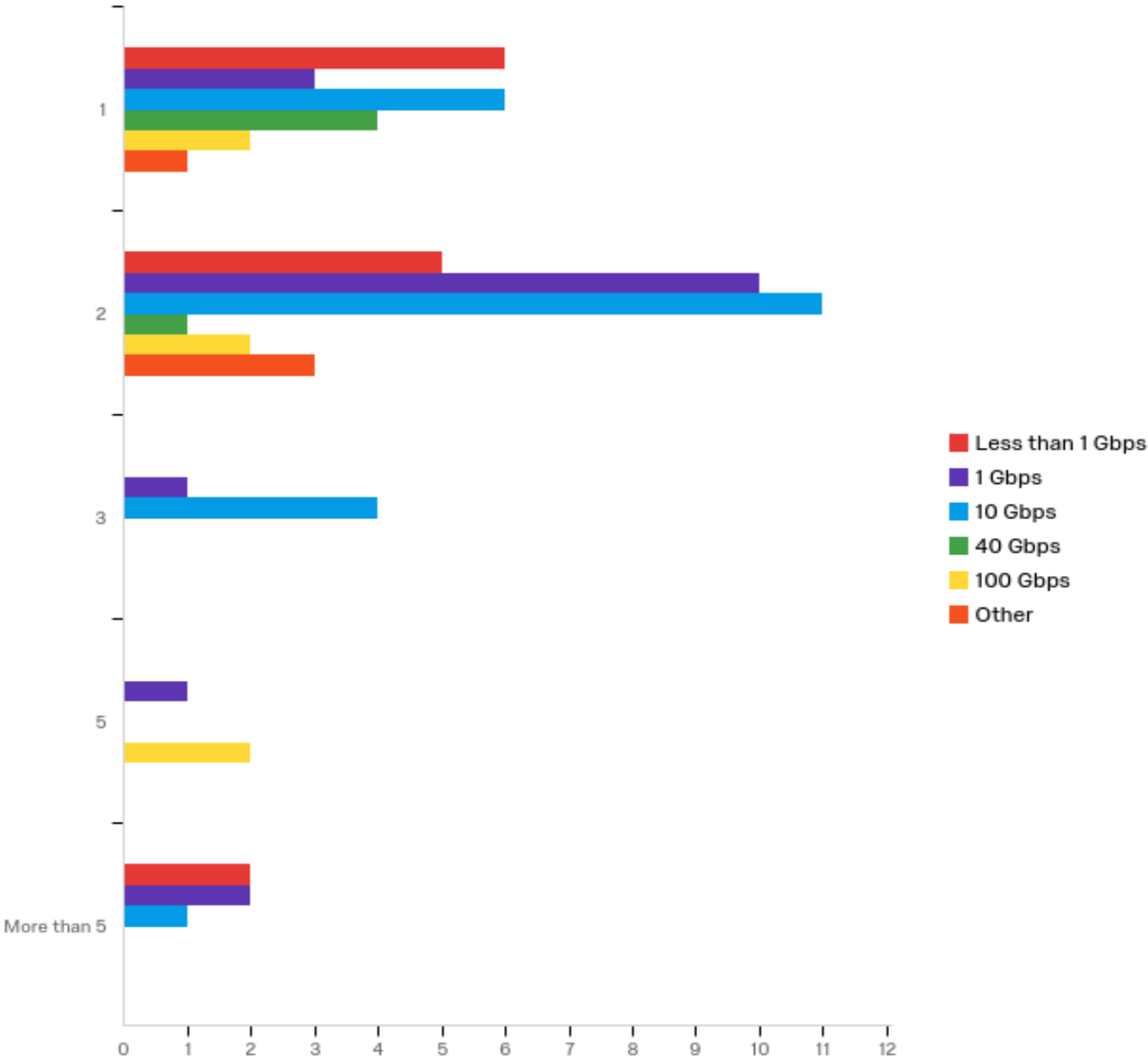


#	Answer	%	Count
1	0	0.00%	0
2	1 to 10	23.81%	10
3	11 to 20	38.10%	16
4	21 to 50	9.52%	4
5	51 to 100	9.52%	4
6	101 to 200	4.76%	2



7	201 to 500	2.38%	1
8	500 to 1,000	4.76%	2
9	More than 1,000	2.38%	1
10	Unknown	4.76%	2
	Total	100%	42

# What speed and quantity of upstream network connections to the Internet and other internets do you have from your main campus?



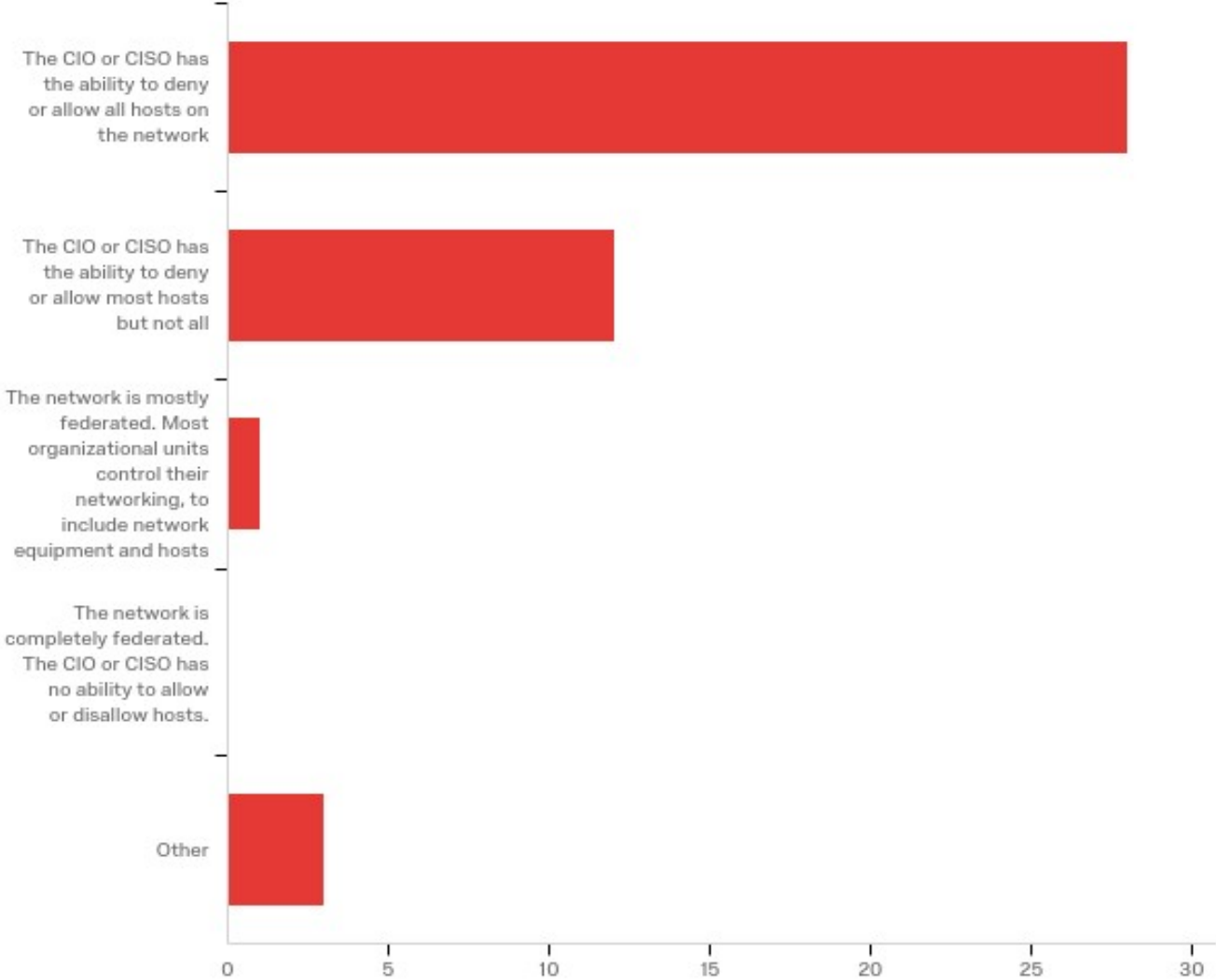
#	Question	0	1	2	3	5	More than 5	Total
1	Less than 1 Gbps	18.75%	37.50%	31.25%	0.00%	0.00%	12.50%	16
2	1 Gbps	19.05%	14.29%	47.62%	4.76%	4.76%	9.52%	21

3	10 Gbps	15.3 8%	4	23.0 8%	6	42.3 1%	11	15.3 8%	4	0.00 %	0	3.85 %	1	26
4	40 Gbps	58.3 3%	7	33.3 3%	4	8.33 %	1	0.00 %	0	0.00 %	0	0.00 %	0	12
5	100 Gbps	53.8 5%	7	15.3 8%	2	15.3 8%	2	0.00 %	0	15.3 8%	2	0.00 %	0	13
6	Other	33.3 3%	2	16.6 7%	1	50.0 0%	3	0.00 %	0	0.00 %	0	0.00 %	0	6

## Other

Other
3 gig and 5 gig
2
KINBER cache 1 Gbps
3Gbps

**How is the network managed at your institution? For the purposes of this question, who has the responsibility to track hosts and allow or disallow hosts on the network?**



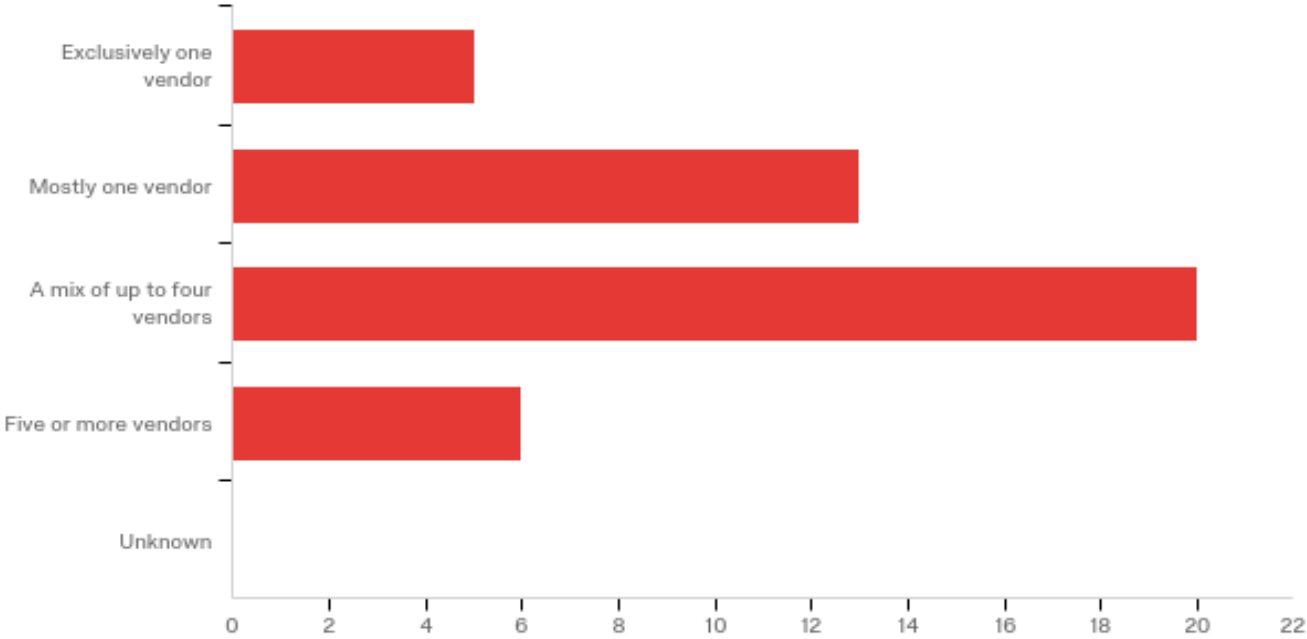
#	Answer	%	Count
1	The CIO or CISO has the ability to deny or allow all hosts on the network	63.64%	28
2	The CIO or CISO has the ability to deny or allow most hosts but not all	27.27%	12
3	The network is mostly federated. Most organizational units control their networking, to include network equipment and hosts	2.27%	1

4	The network is completely federated. The CIO or CISO has no ability to allow or disallow hosts.	0.00%	0
5	Other	6.82%	3
	Total	100%	44

## Other

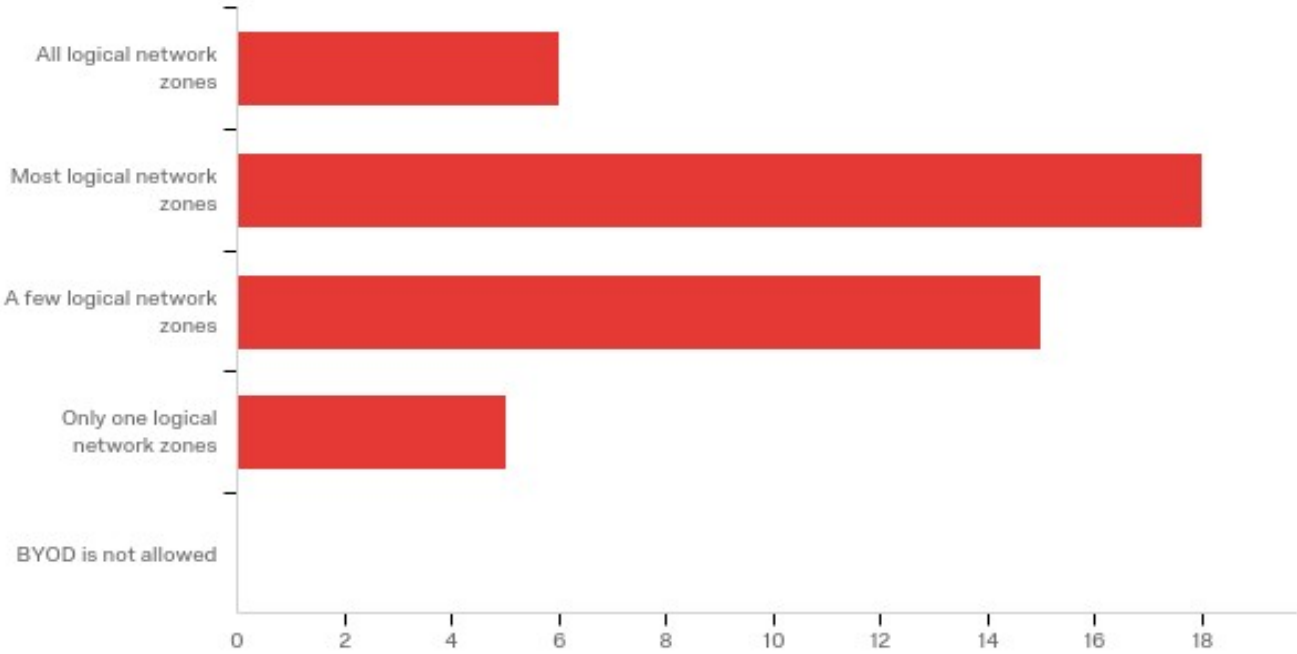
Other
Managed by networking, no controls
Network Admin can deny or allow all hosts
Networking does what it wants

# How many different vendors supply networking equipment, including wireless infrastructure, for your institution?



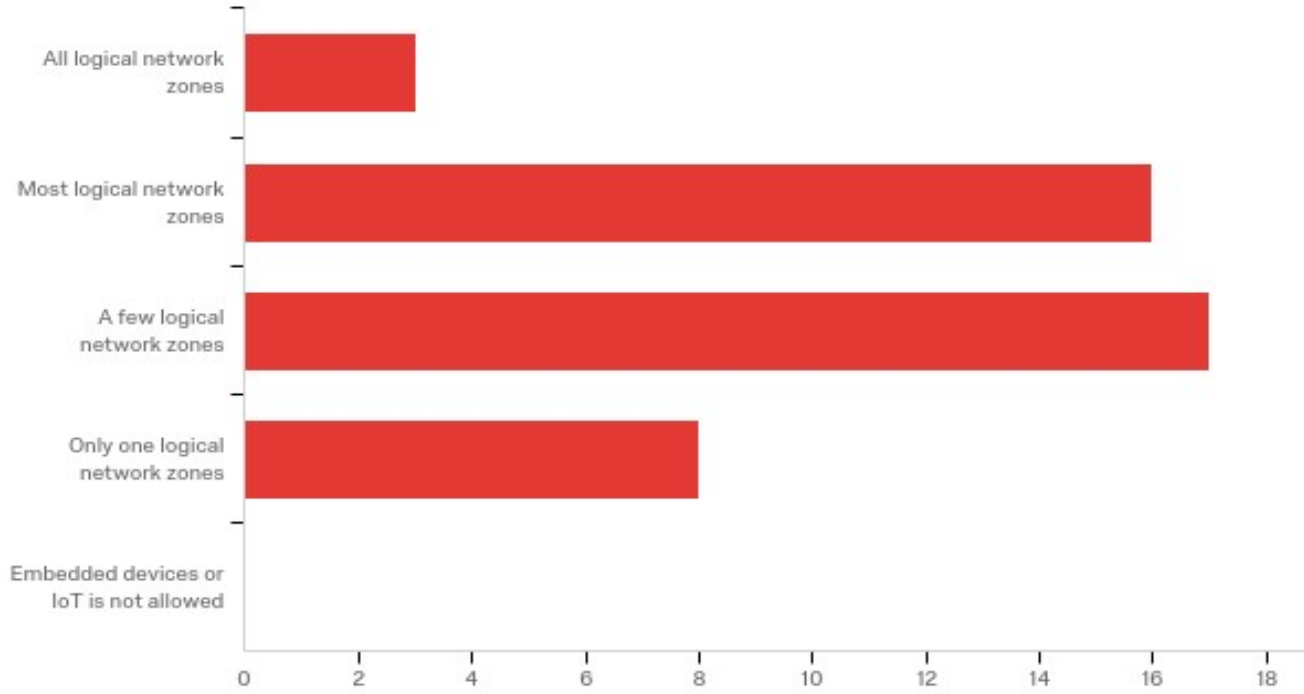
#	Answer	%	Count
1	Exclusively one vendor	11.36%	5
2	Mostly one vendor	29.55%	13
3	A mix of up to four vendors	45.45%	20
4	Five or more vendors	13.64%	6
5	Unknown	0.00%	0
	Total	100%	44

# Where does your institution allow Bring Your Own Devices (BYOD) hosts on your network?



#	Answer	%	Count
1	All logical network zones	13.64%	6
2	Most logical network zones	40.91%	18
3	A few logical network zones	34.09%	15
4	Only one logical network zones	11.36%	5
5	BYOD is not allowed	0.00%	0
	Total	100%	44

# Where does your institution allow embedded hosts or Internet of Things (IoT) on your network?



#	Answer	Count
1	All logical network zones	3
2	Most logical network zones	16
3	A few logical network zones	17
4	Only one logical network zones	8
5	Embedded devices or IoT is not allowed	0
	Total	44



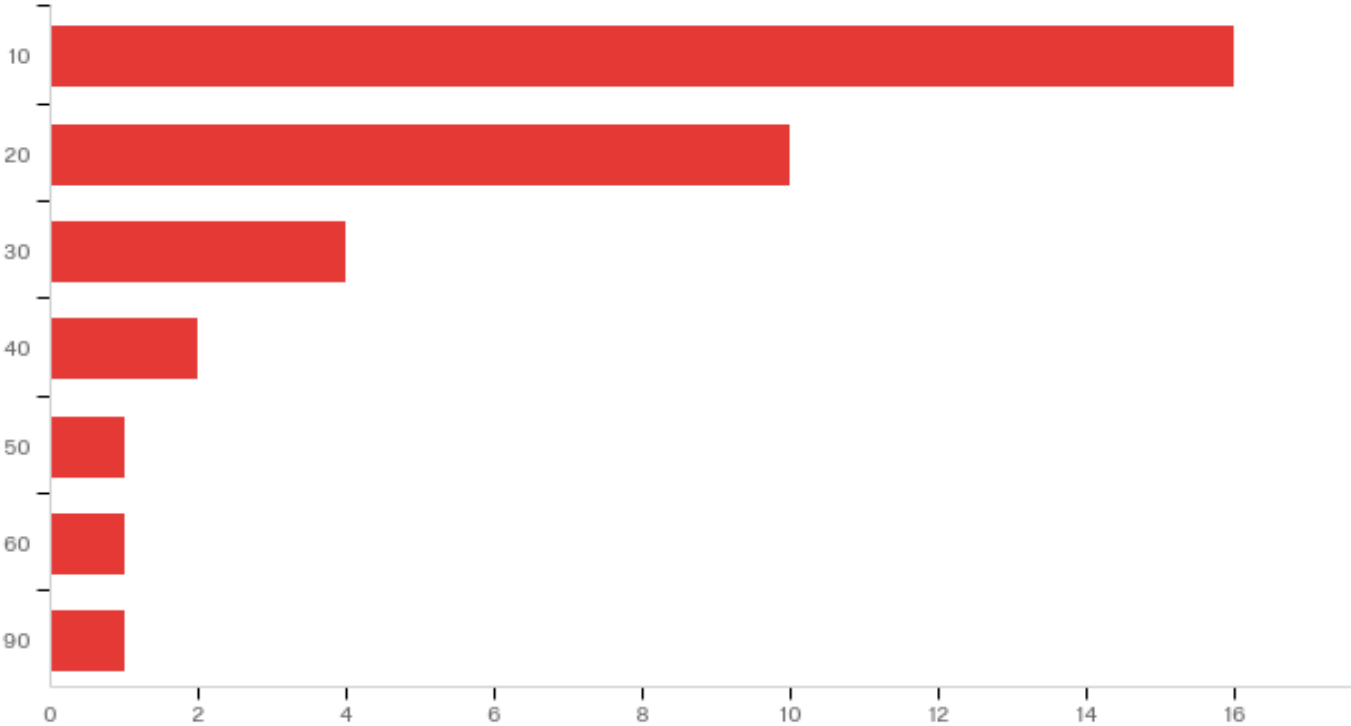
What is the estimated percentage of each type of host on your network? The sum should be 100%.

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Embedded devices (IoT, printers, cameras, etc.)	0.00	25.00	8.92	6.06	36.67	37
2	Servers with full operating systems (either physical or virtual)	1.00	80.00	15.81	14.20	201.56	37
3	Institution owned end-user devices (desktops, laptops, mobile devices)	4.00	75.00	34.00	16.28	264.92	37
4	BYOD end-user devices (desktops, laptops, mobile devices)	0.00	92.00	39.24	20.39	415.81	37
5	Other	0.00	11.00	0.84	2.54	6.46	37

Q4.1\_5\_TEXT - Other

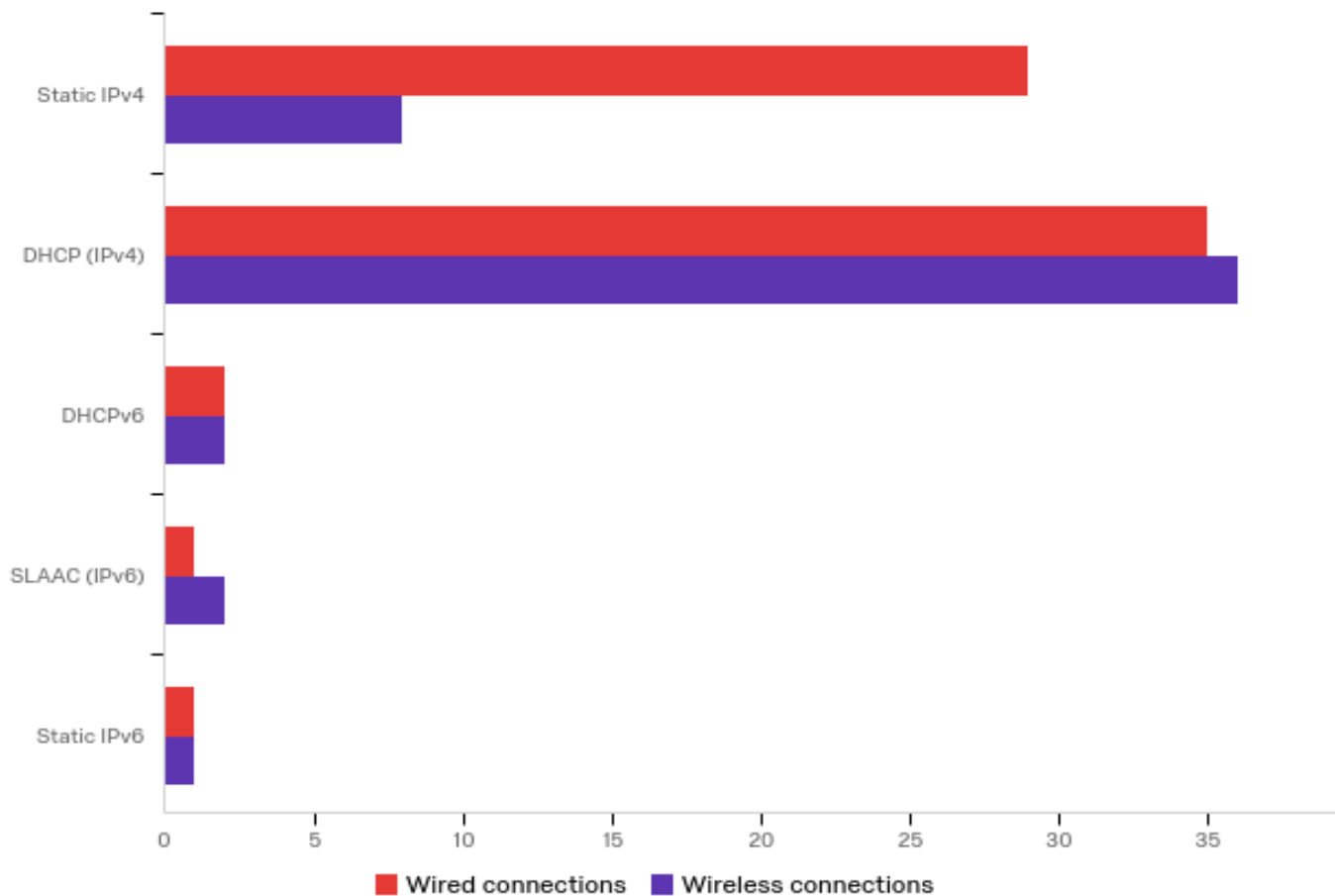
Other
LAN printers
VOIP Phones

# What percentage of all hosts on your network use a statically assigned IP address?



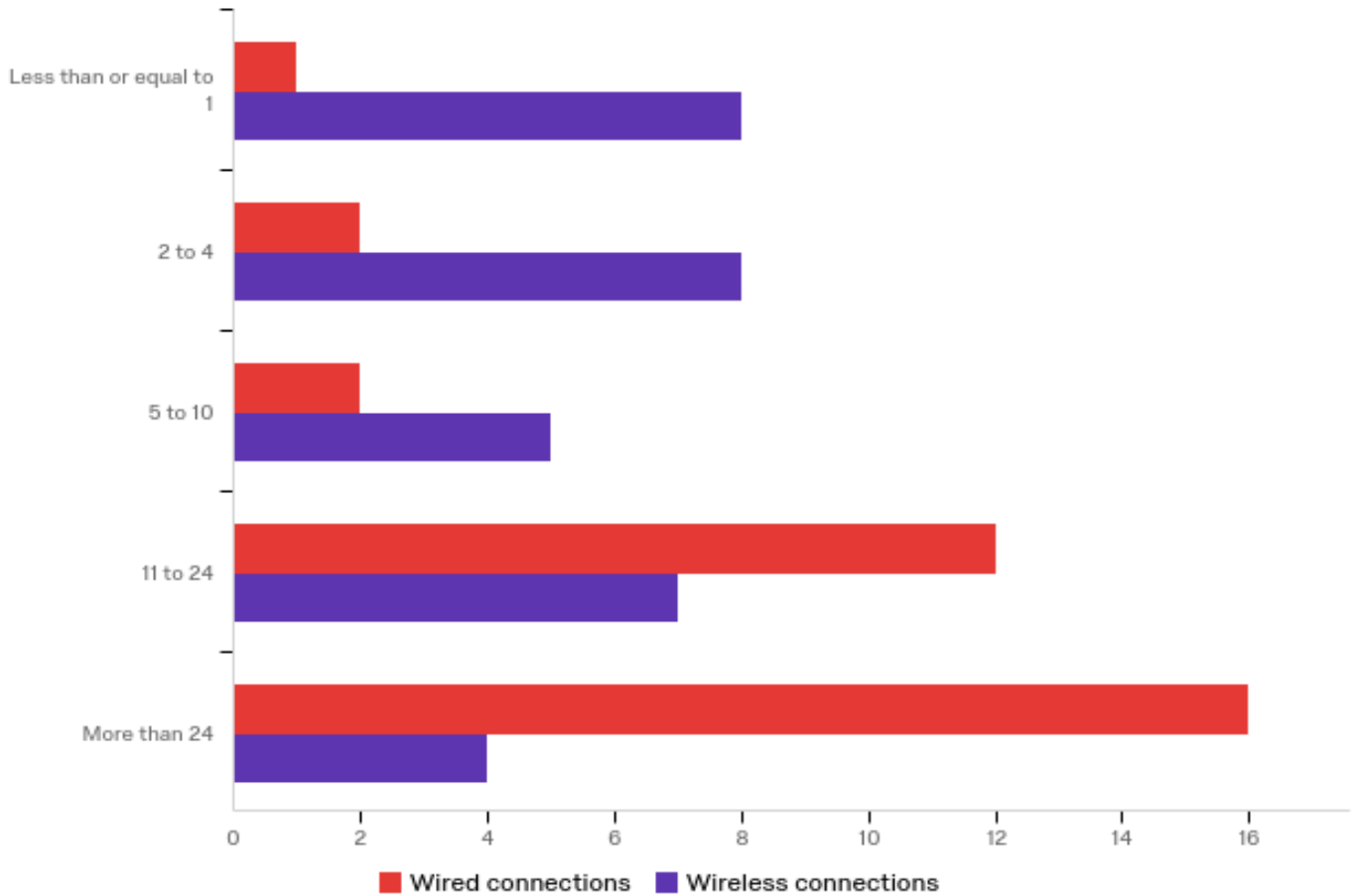
Answer	%	Count
0	2.78%	1
10	44.44%	16
20	27.78%	10
30	11.11%	4
40	5.56%	2
50	2.78%	1
60	2.78%	1
90	2.78%	1
Total	100%	36

## What IP addressing methods do you use?



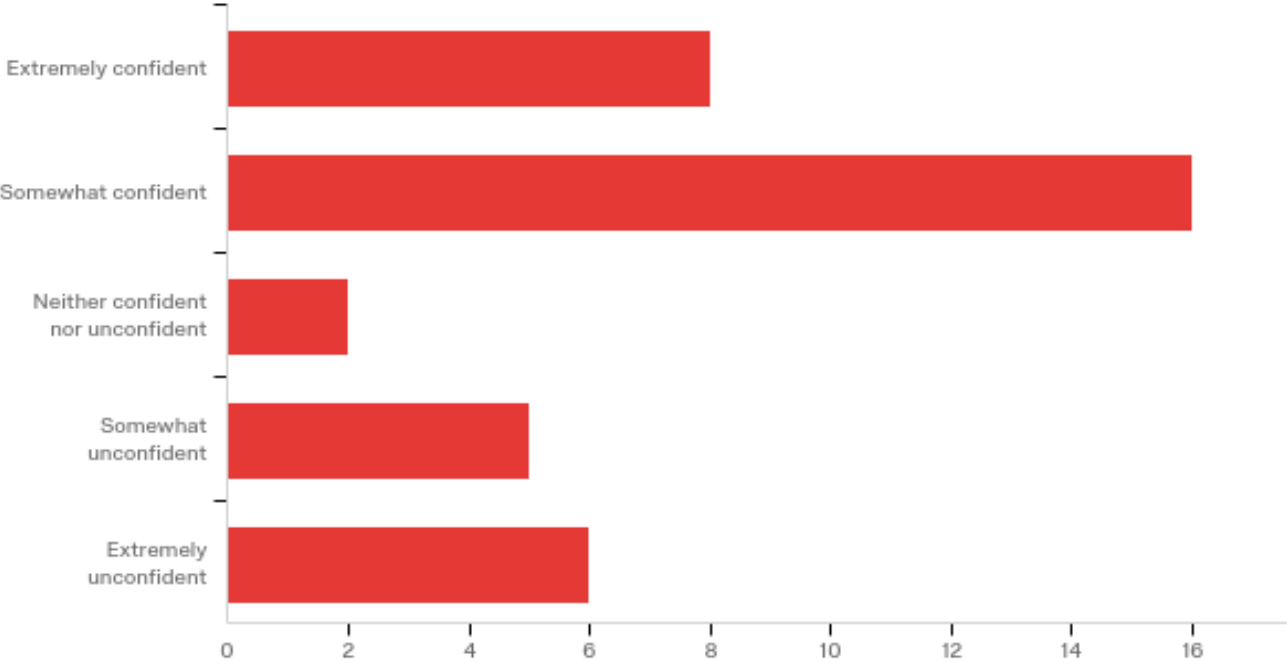
#	Question	Static IPv4		DHCP (IPv4)		DHCP v6		SLAAC (IPv6)		Static IPv6		Total
1	Wired connections	42.65%	29	51.47%	35	2.94%	2	1.47%	1	1.47%	1	68
2	Wireless connections	16.33%	8	73.47%	36	4.08%	2	4.08%	2	2.04%	1	49

How long do you have DHCP lease times set? Time is measured in hours.



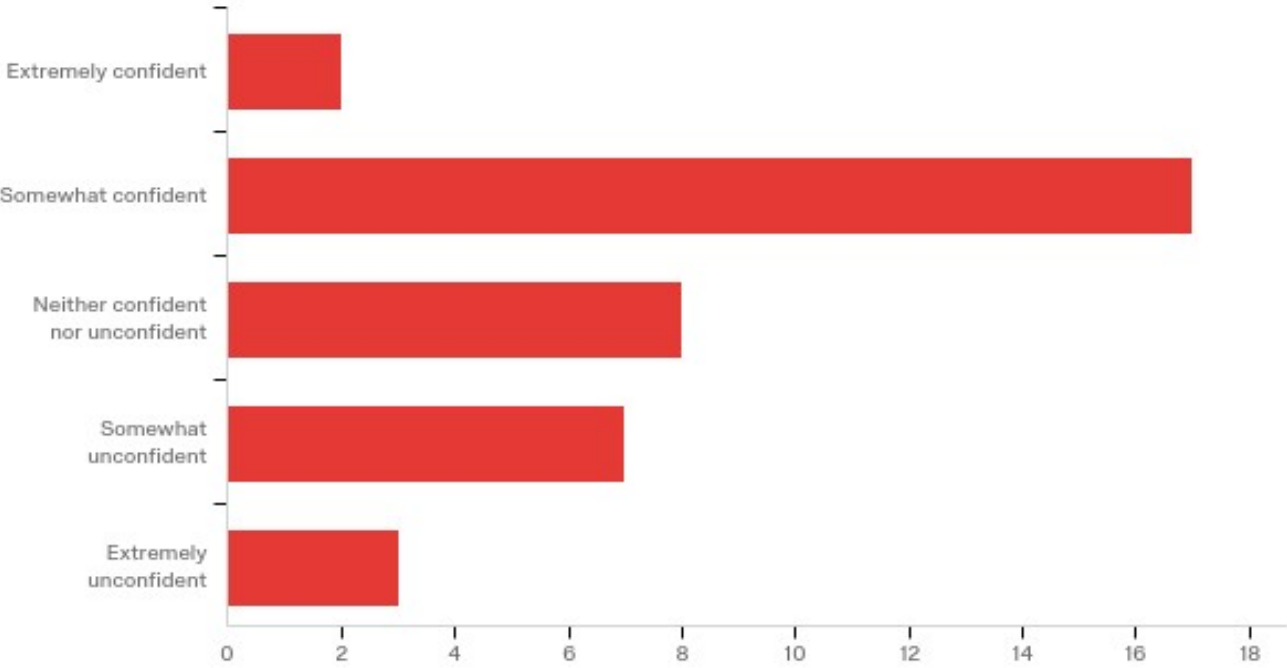
#	Question	Less than or equal to 1	2 to 4	5 to 10	11 to 24	More than 24	Unknown	Total
1	Wired connections	2.78% 1	5.56% 2	5.56% 2	33.33% 12	44.44% 16	8.33% 3	36
2	Wireless connections	22.22% 8	22.22% 8	13.89% 5	19.44% 7	11.11% 4	11.11% 4	36

How confident are you in your ability to identify unique, individual hosts which have multiple network connections, such as Ethernet and WiFi? An example might be a laptop with a wired Ethernet and WiFi connection, where each is used at different times. In this example, it is a single host but seen by the network at different times using different connections and IP addresses.



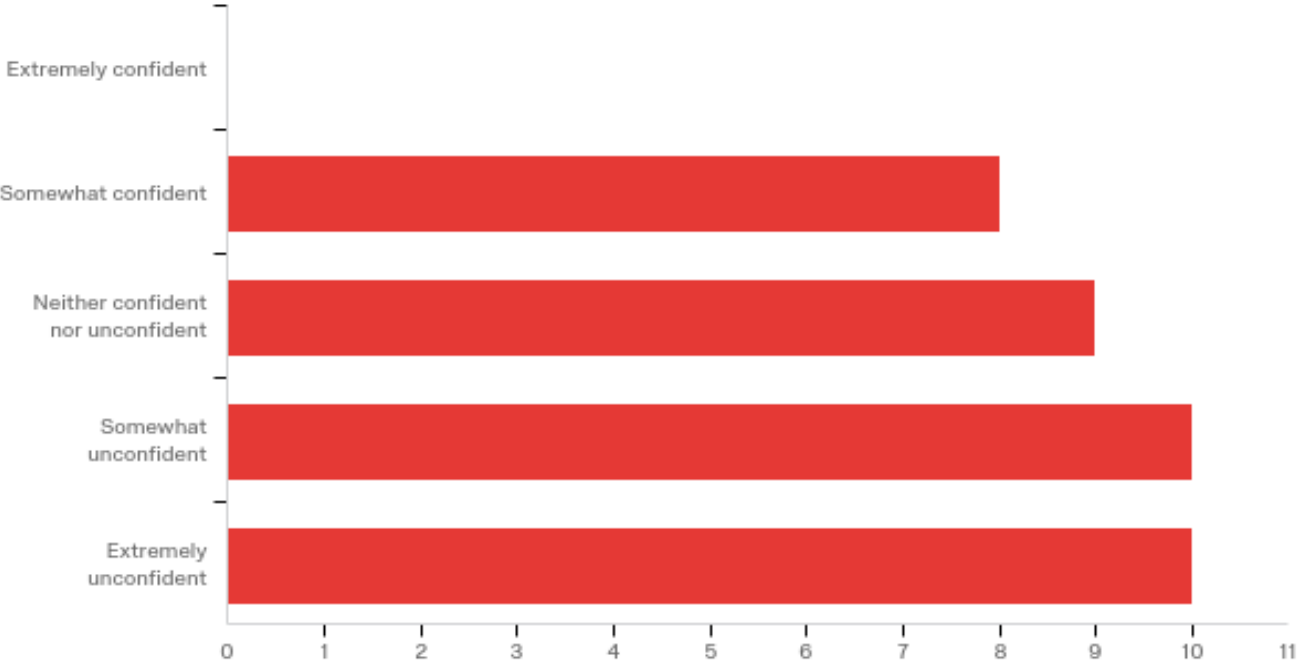
#	Answer	%	Count
1	Extremely confident	21.62%	8
2	Somewhat confident	43.24%	16
3	Neither confident nor unconfident	5.41%	2
4	Somewhat unconfident	13.51%	5
5	Extremely unconfident	16.22%	6
	Total	100%	37

# How confident are you in your ability to identify unique, individual hosts which are virtual machines?



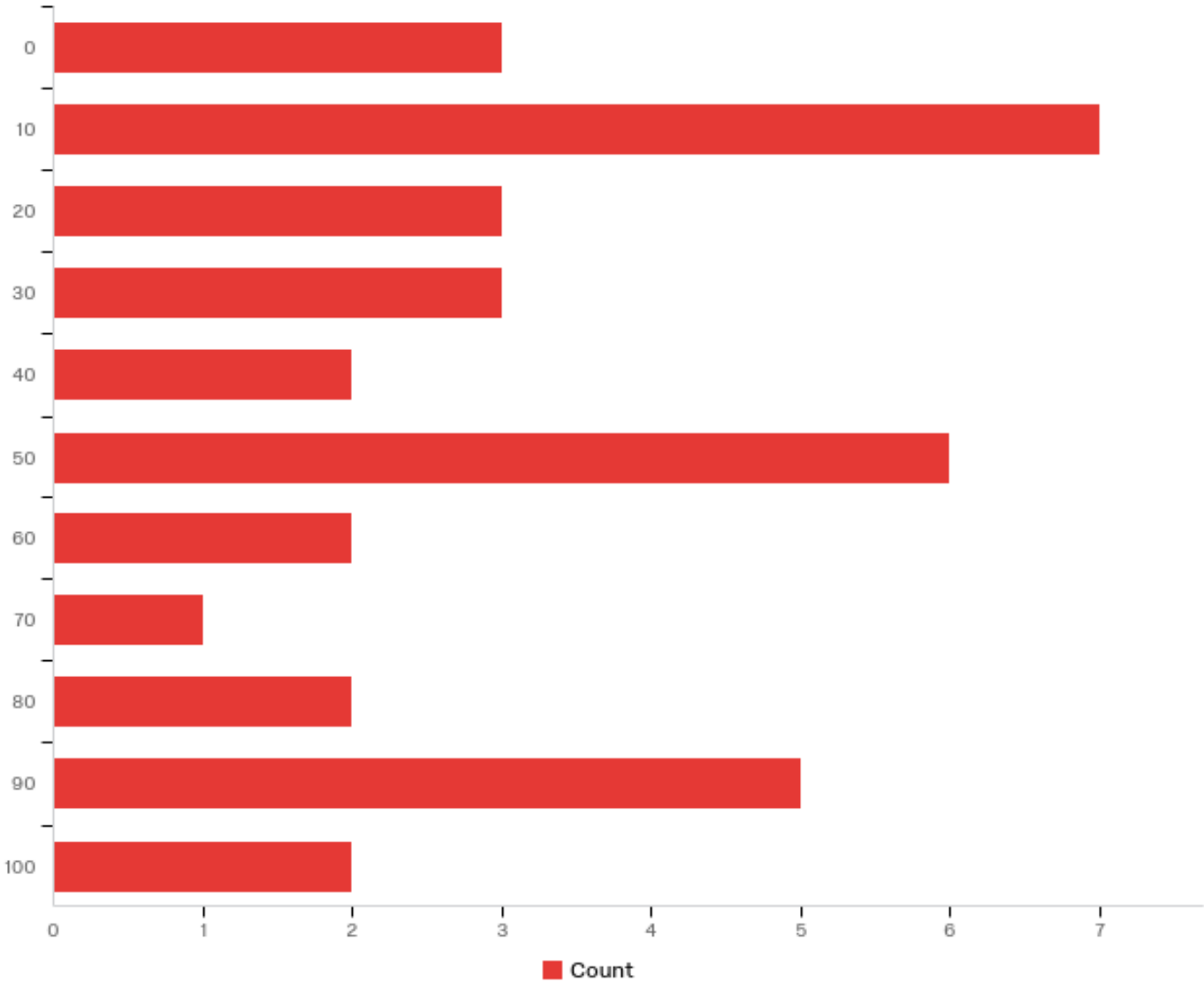
#	Answer	Count
1	Extremely confident	2
2	Somewhat confident	17
3	Neither confident nor unconfident	8
4	Somewhat unconfident	7
5	Extremely unconfident	3
	Total	37

How confident are you in your organization’s ability to identify hosts with multiple, changing addresses, to include application containers (Docker) and IPv6 privacy extensions (RFC 4941)?



#	Answer	Count
4	Somewhat unconfident	10
5	Extremely unconfident	10
3	Neither confident nor unconfident	9
2	Somewhat confident	8
1	Extremely confident	0
	Total	37

**What percentage of hosts on your network utilize some form of network authentication to connect (IEEE 802.1x, NAC, etc.)?**



Answer	%	Count
0	8.33%	3
10	19.44%	7
20	8.33%	3
30	8.33%	3
40	5.56%	2
50	16.67%	6
60	5.56%	2



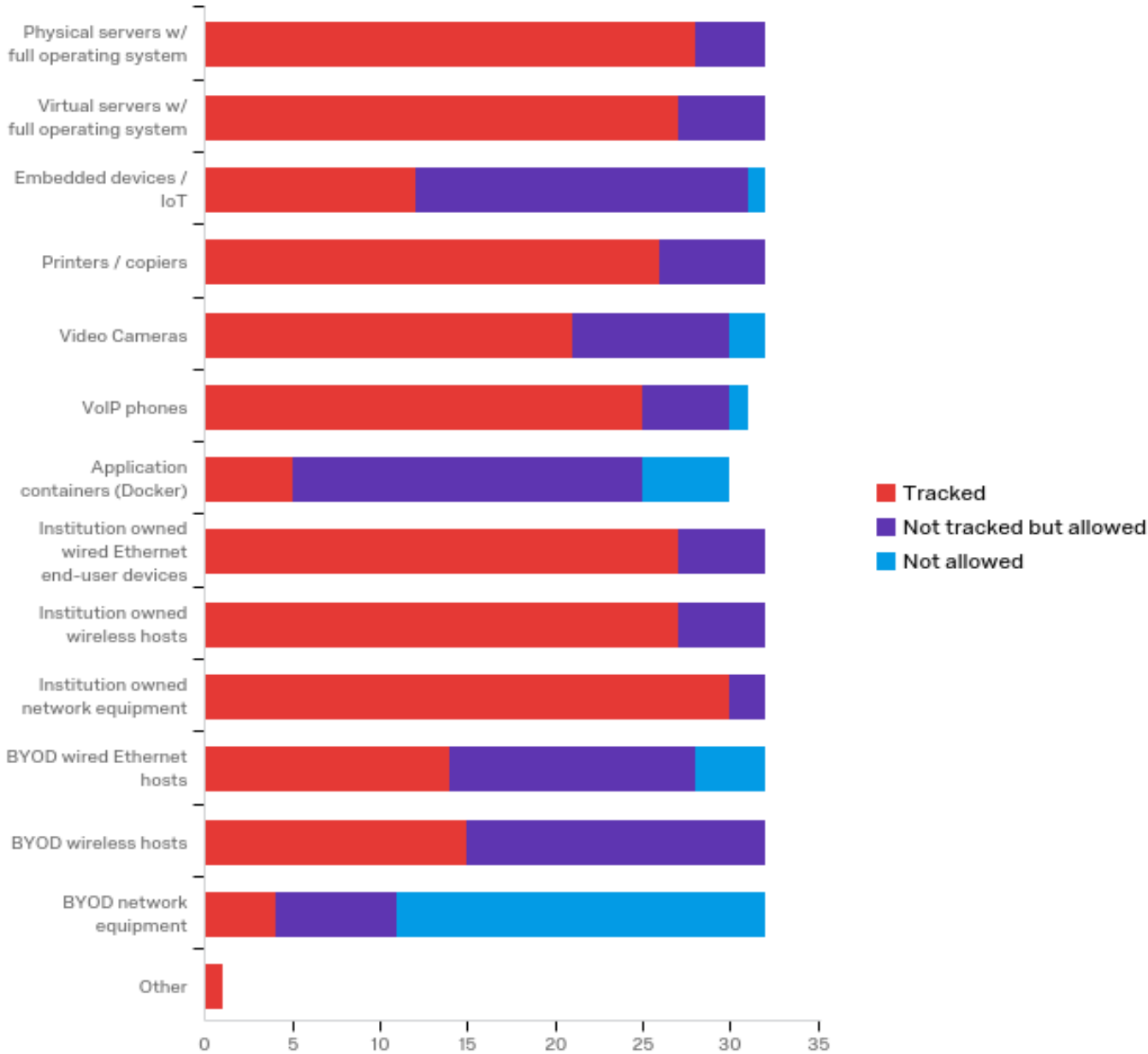
70	2.78%	1
80	5.56%	2
90	13.89%	5
100	5.56%	2
Total	100%	36

**For the purpose of inventory control, how does your institution define what a host is? For example, is a host defined by one or more MAC addresses, a unique certificate, or other mechanism?**

For the purpose of inventory control, how does your institution define what...
Mac address
MAC address
MAC
MAC address
one or more MAC addresses
unique mac address, and/or mac+other device fingerprints
MAC
One or more MAC addresses
machine name and mac address
MAC address
Primary MAC address
Mac
mac address
defined by one or more MAC addresses
Generally by MAC address, understanding that this can count some hosts more than once (wired/wireless) and can miss some hosts (virtual machines using NAT)
MAC
One or more MAC addresses
No specific definition :(
mac address
MAC address, typically
mac address
MAC address. VM's are included too as they have IP addresses.
IP or MAC
In the server room it's currently by OS (used to include Solaris Zones) and/or physical hosts - User Devices - by physical host
unique MAC address
MAC addresses

IPv4 address, DNS name or both
MAC addresses
One Mac Address.
MAC address (though physical tags and dollar limits are a factor too)
mac
Varies greatly across the system - generally visible IP addresses.
MAC
MAC address and/or AD membership
host has one or more MAC addresses
MAC Addresses

For the purposes of your host inventory controls, what types of hosts do you track?  
 Select any which apply.



#	Question	Tracked	Not tracked but allowed	Not allowed	Total
7	Application containers (Docker)	5	20	5	30
3	Embedded devices / IoT	12	19	1	32
12	BYOD wireless hosts	15	17	0	32

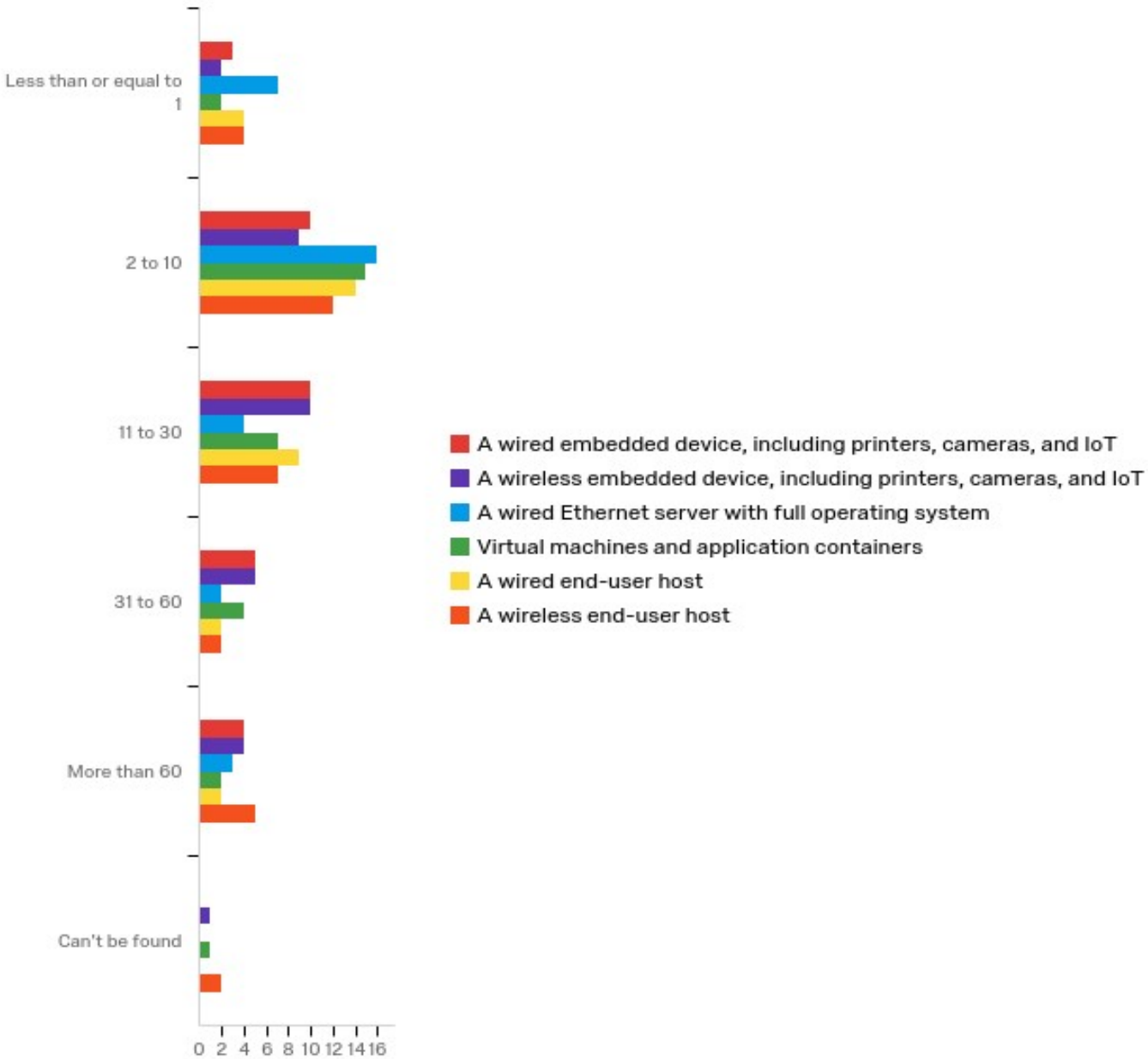
11	BYOD wired Ethernet hosts	14	14	4	32
5	Video Cameras	21	9	2	32
13	BYOD network equipment	4	7	21	32
4	Printers / copiers	26	6	0	32
6	VoIP phones	25	5	1	31
2	Virtual servers w/ full operating system	27	5	0	32
9	Institution owned wireless hosts	27	5	0	32
8	Institution owned wired Ethernet end-user devices	27	5	0	32
1	Physical servers w/ full operating system	28	4	0	32
10	Institution owned network equipment	30	2	0	32
14	Other	1	0	0	1

## Other

Other

Only hosts and gear managed by central IT are tracked routinely.

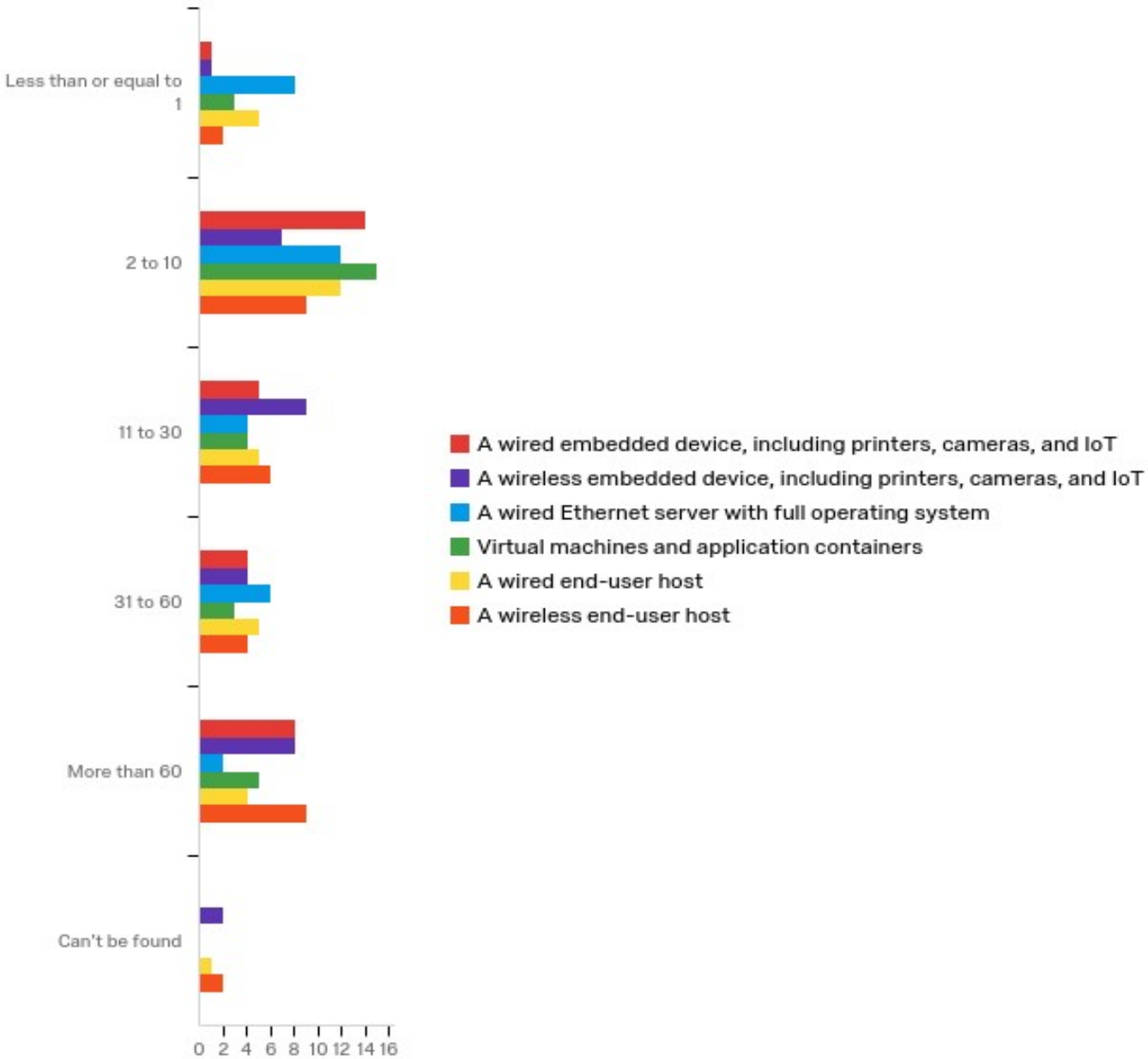
During a potential security incident or event, how long does it usually take to track down the responsible user or owner of these host types? Time is measured in minutes.



#	Question	Less than or equal to 1	2 to 10	11 to 30	31 to 60	More than 60	Can't be found	Not applicable	Total
1	A wired embedded device, including printers,	3	10	10	5	4	0	0	32

	cameras, and IoT								
2	A wireless embedded device, including printers, cameras, and IoT	2	9	10	5	4	1	1	32
3	A wired Ethernet server with full operating system	7	16	4	2	3	0	0	32
4	Virtual machines and applications on containers	2	15	7	4	2	1	1	32
5	A wired end-user host	4	14	9	2	2	0	1	32
6	A wireless end-user host	4	12	7	2	5	2	0	32

During a potential security incident or event, how long does it usually take to track down the physical location of these host types? Time is measured in minutes.

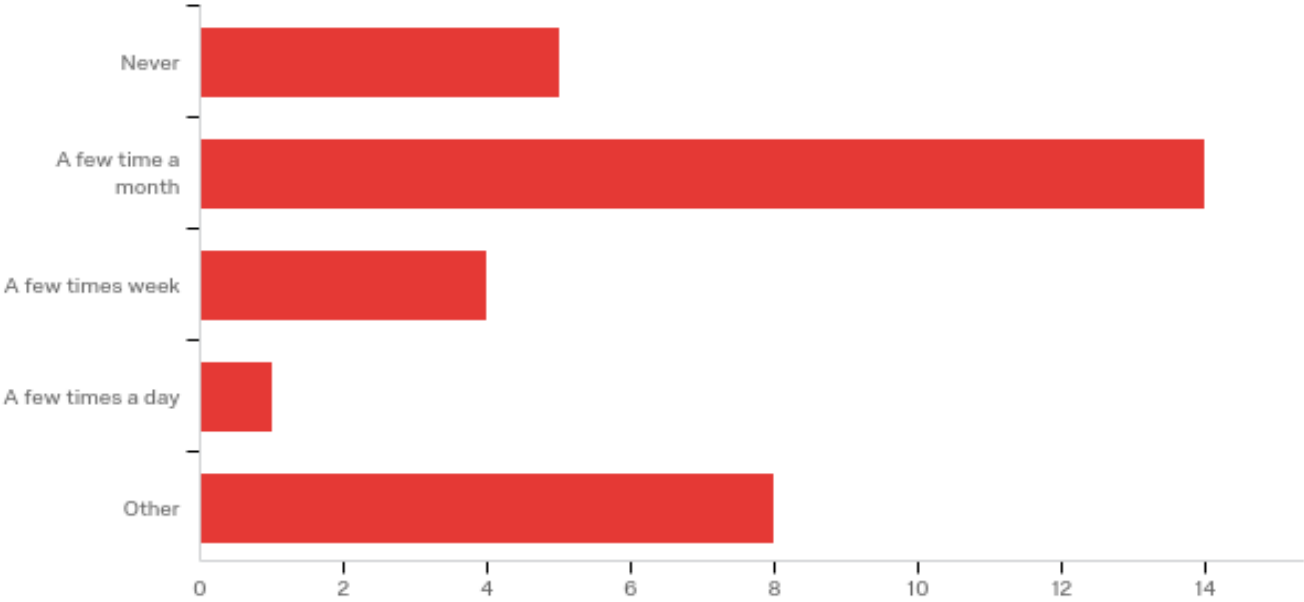


#	Question	Less than or equal to 1	2 to 10	11 to 30	31 to 60	More than 60	Can't be found	Not applicable	Total
1	A wired embedded device, including printers,	1	14	5	4	8	0	0	32



	cameras, and IoT									
2	A wireless embedded device, including printers, cameras, and IoT	1	7	9	4	8	2	1	32	
3	A wired Ethernet server with full operating system	8	12	4	6	2	0	0	32	
4	Virtual machines and application containers	3	15	4	3	5	0	2	32	
5	A wired end-user host	5	12	5	5	4	1	0	32	
6	A wireless end-user host	2	9	6	4	9	2	0	32	

How often do your inventory controls and tools lead to someone who is not the current responsible user? In this situation, you have to ask that individual if they know who is the responsible user or use other information sources to find the actual responsible user.



#	Answer	%	Count
1	Never	15.63%	5
2	A few time a month	43.75%	14
3	A few times week	12.50%	4
4	A few times a day	3.13%	1
5	Other	25.00%	8
	Total	100%	32

Q5.4\_5\_TEXT - Other

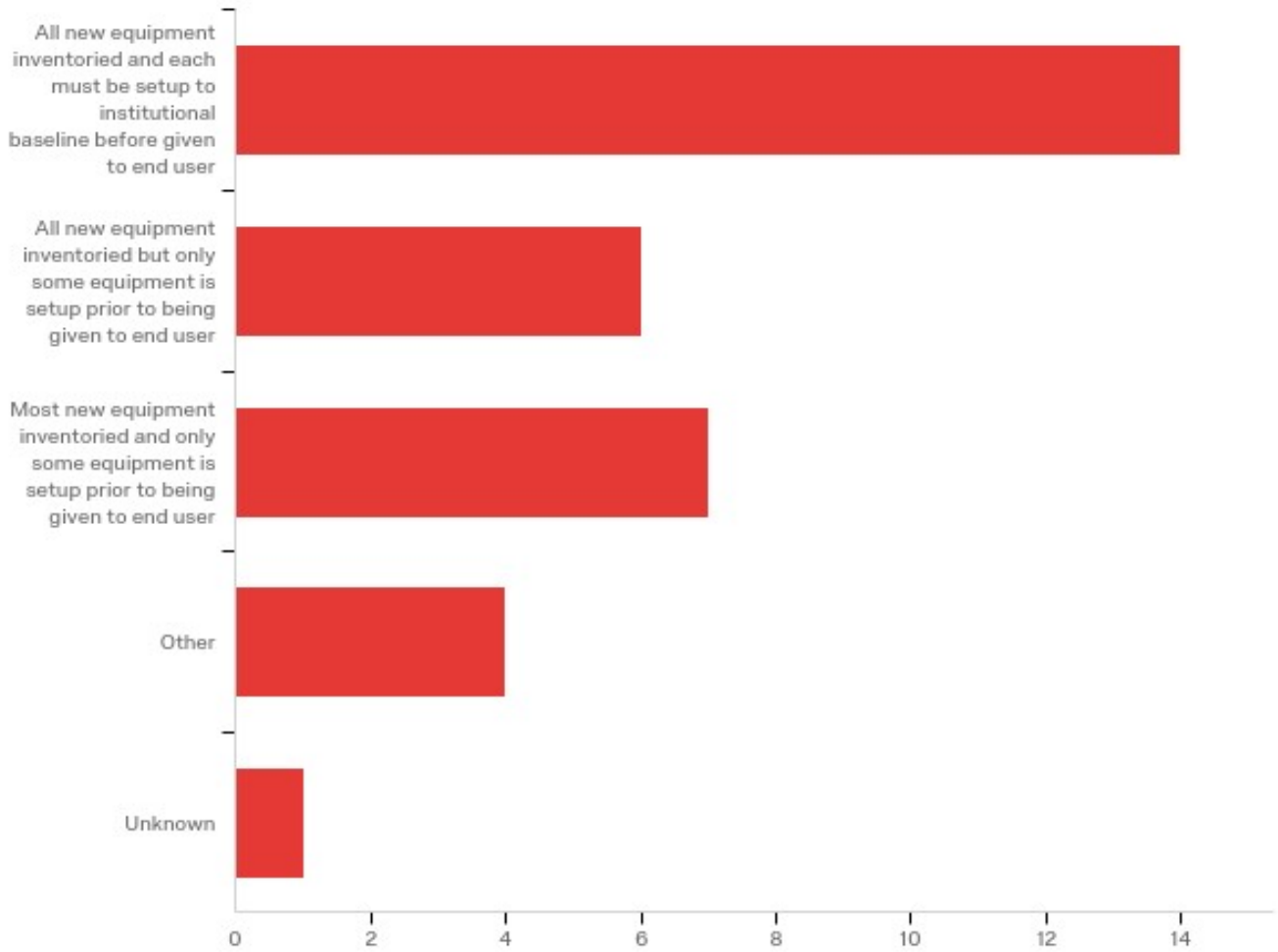
Other
A few times per year
Never say never, but it's rare
annual check
A few a year

Staff - Never; Labs almost always

varies widely

rarely

## How does your institution procure and prepare for first use a host on the network?



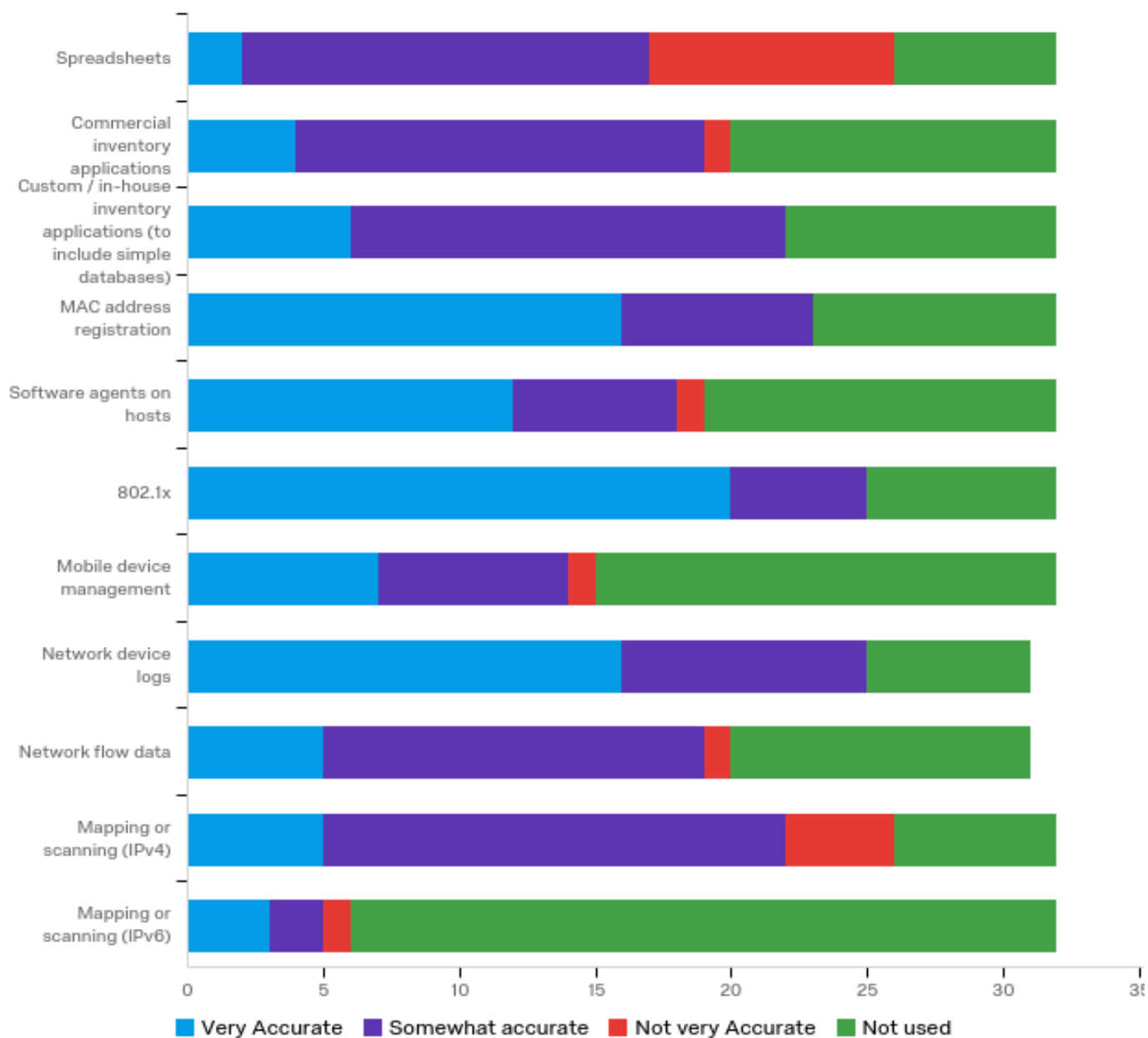
#	Answer	%	Count
1	All new equipment inventoried and each must be setup to institutional baseline before given to end user	43.75%	14
2	All new equipment inventoried but only some equipment is setup prior to being given to end user	18.75%	6
3	Most new equipment inventoried and only some equipment is setup prior to being given to end user	21.88%	7
4	Other	12.50%	4
5	Unknown	3.13%	1

	Total	100%	32
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## Other

Other
Highly distributed - in central IT, equipment is inventoried and setup to baseline prior to use by user. Other departments may do the same, but it is not yet tracked at the central level.
we have a home grown network registration system, but no inventory system. There are institutional baselines, but compliance is ad hoc
End users do their own machines
Some is inventoried and less baselined.

## How accurate have you found the following tools and technologies to be in keeping track of hosts in your network?



#	Question	Not very Accurate	Somewhat accurate	Very Accurate	Not used	Total
1	Spreadsheets	9	15	2	6	32
2	Commercial inventory applications	1	15	4	12	32
3	Custom / in-house inventory	0	16	6	10	32

	applications (to include simple databases)						
4	MAC address registration	0	7	16	9	32	
5	Software agents on hosts	1	6	12	13	32	
6	802.1x	0	5	20	7	32	
7	Mobile device management	1	7	7	17	32	
8	Network device logs	0	9	16	6	31	
9	Network flow data	1	14	5	11	31	
10	Mapping or scanning (IPv4)	4	17	5	6	32	
11	Mapping or scanning (IPv6)	1	2	3	26	32	
12	Other	0	1	1	5	7	

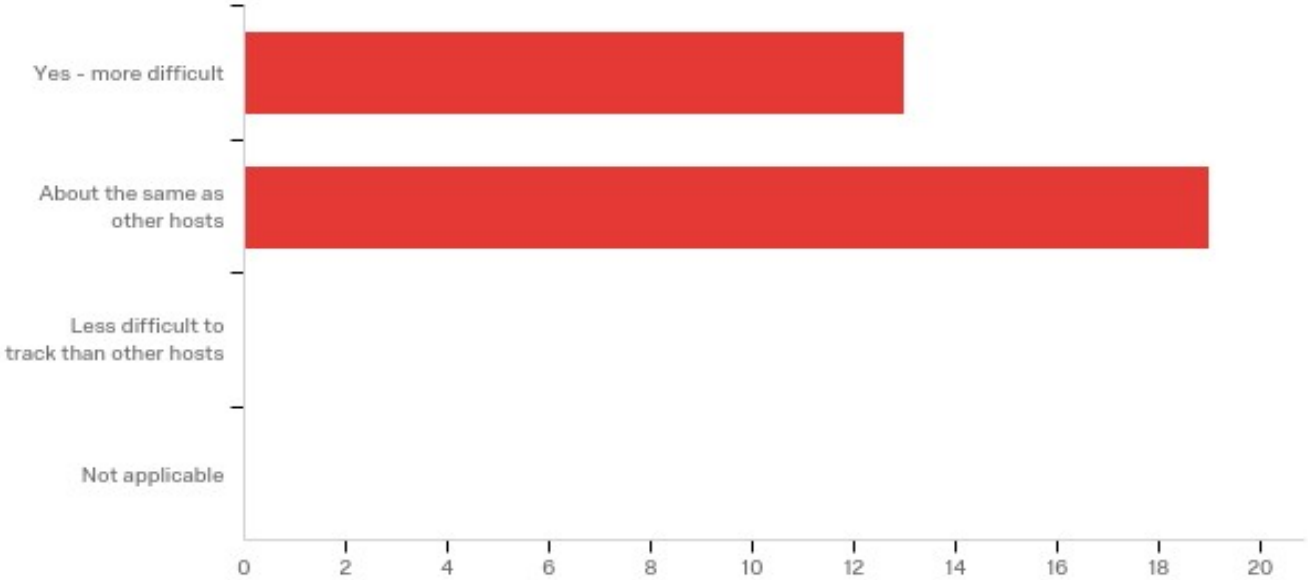
## Other

Other

Network Access Control

we log ip and mac address pairings over time, which is helpful on the wired nets

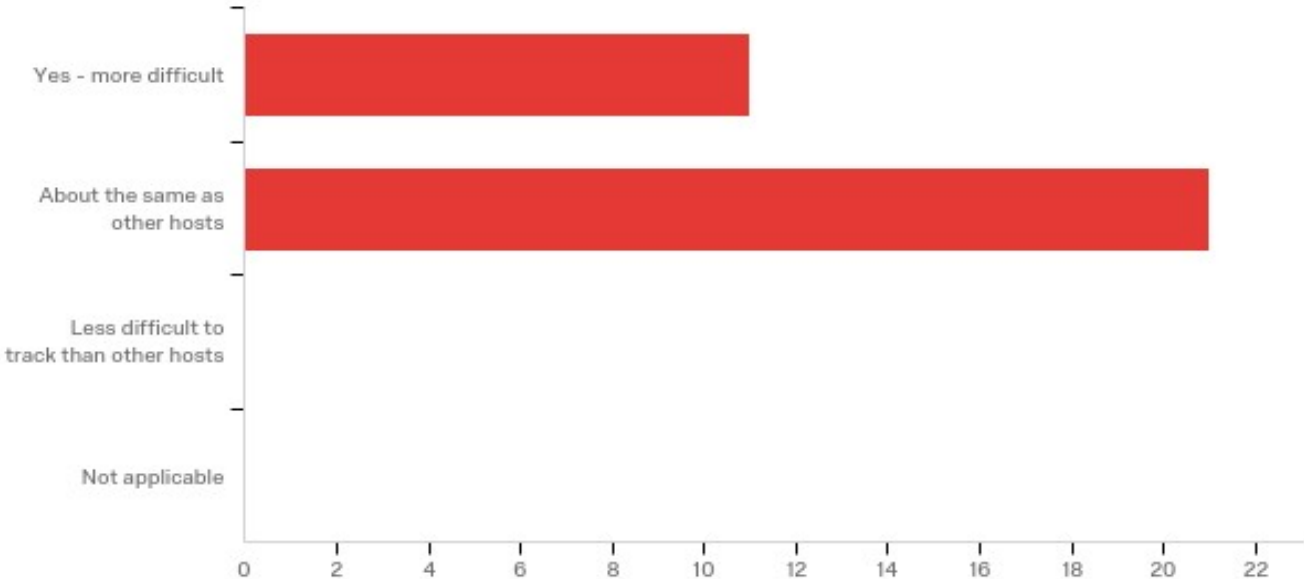
# Do you consider embedded devices or IoT hosts more difficult to track than other hosts?



#	Answer	Count
1	Yes - more difficult	13
2	About the same as other hosts	19
3	Less difficult to track than other hosts	0
4	Not applicable	0
	Total	32

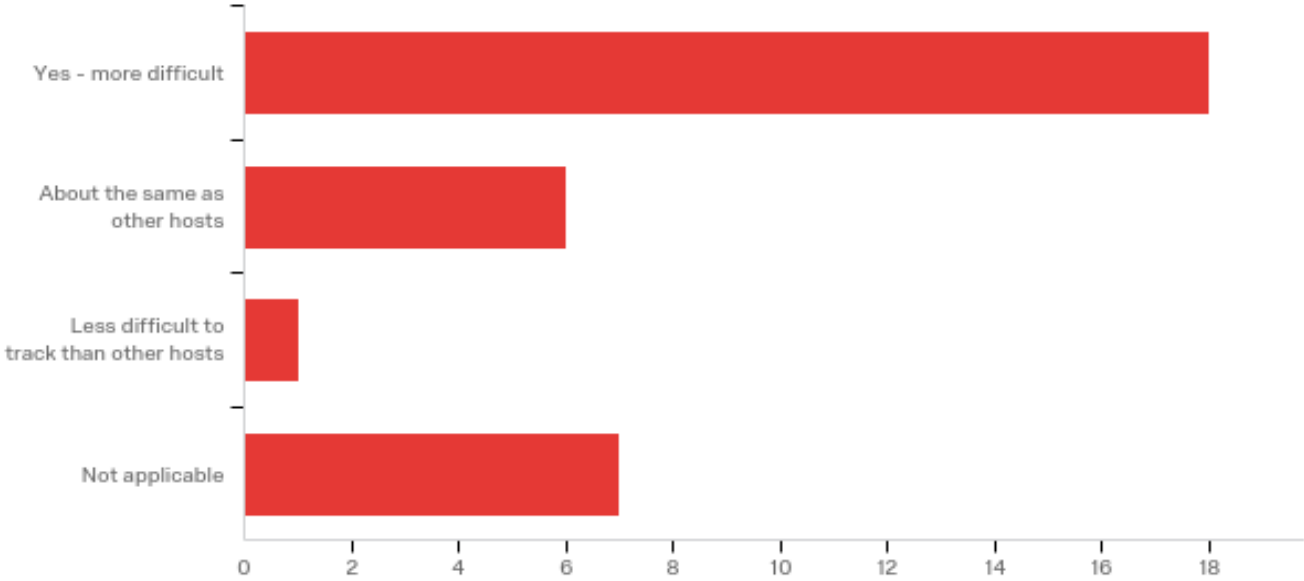


**Do you consider BYOD (non-institutionally owned) hosts more difficult to track than institutionally owned hosts?**



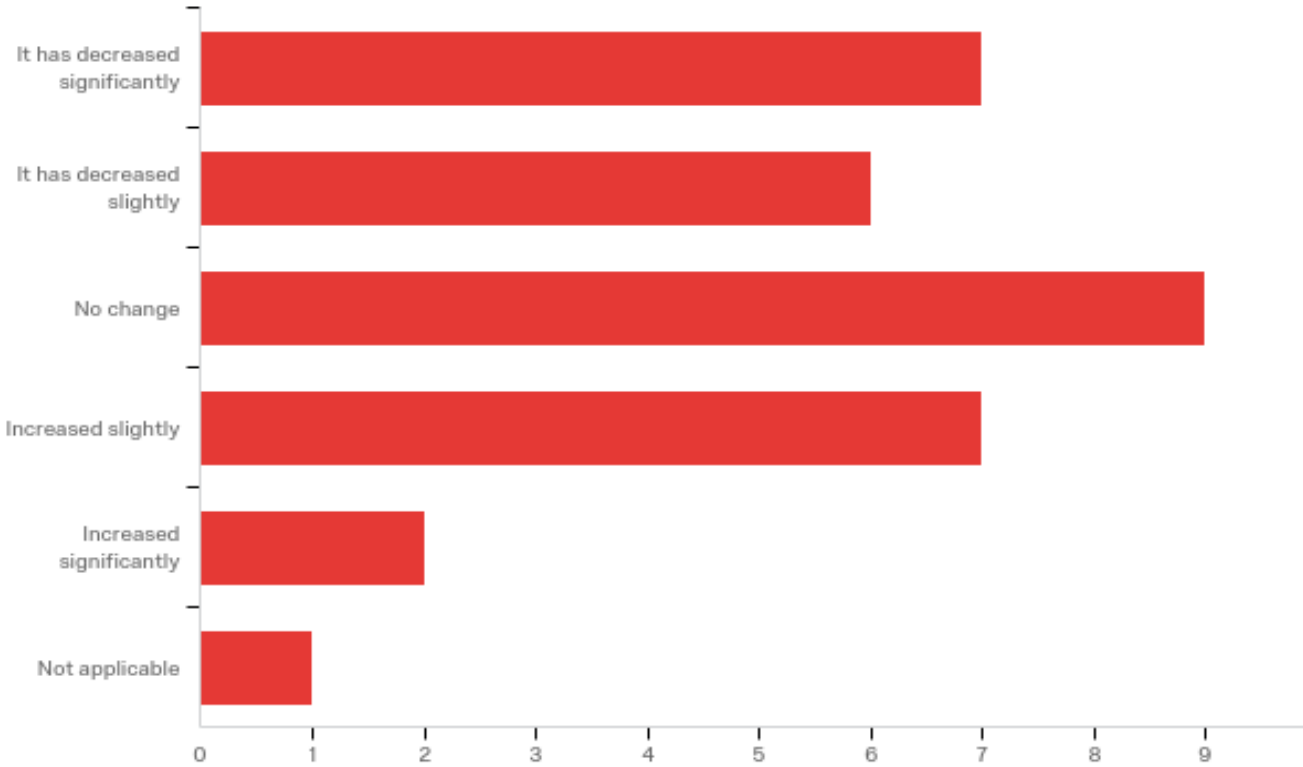
#	Answer	Count
1	Yes - more difficult	11
2	About the same as other hosts	21
3	Less difficult to track than other hosts	0
4	Not applicable	0
	Total	32

# Does Network Address Transition (NAT) or Port Address Translation (PAT) make host identification location more difficult to track?



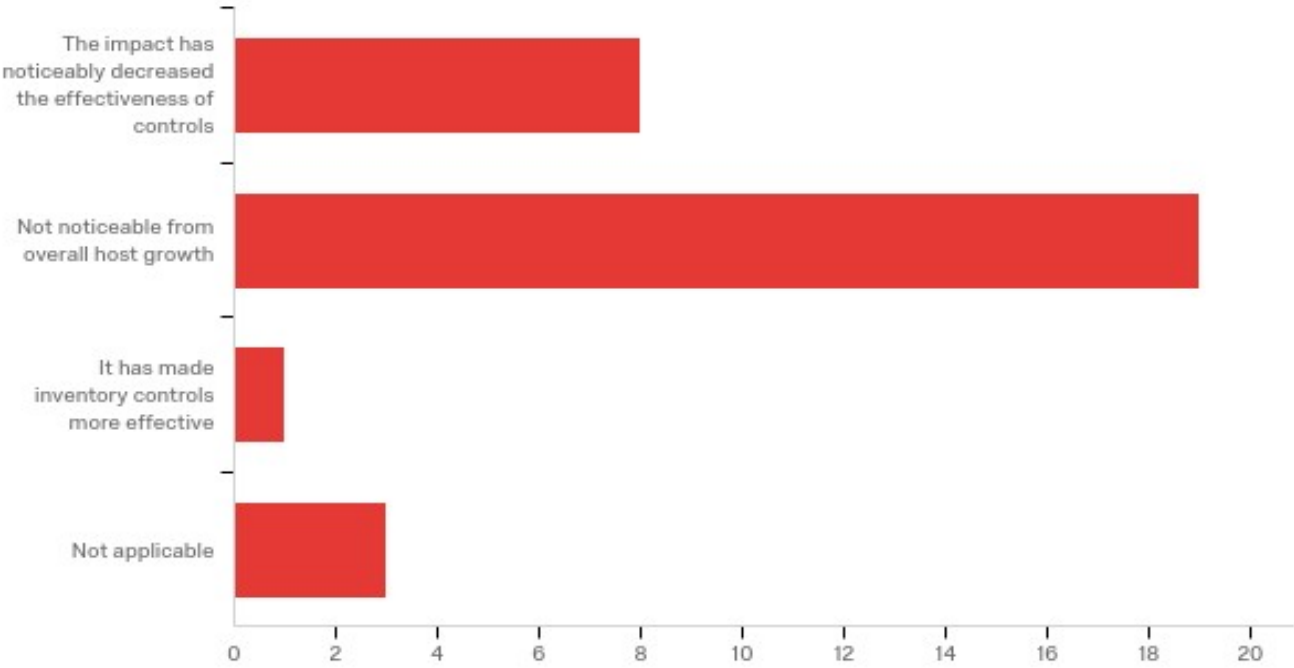
#	Answer	%	Count
1	Yes - more difficult	56.25%	18
2	About the same as other hosts	18.75%	6
3	Less difficult to track than other hosts	3.13%	1
4	Not applicable	21.88%	7
	Total	100%	32

# Has the effectiveness of your network's host inventory controls changed with increases in the total number of hosts in the past five years?



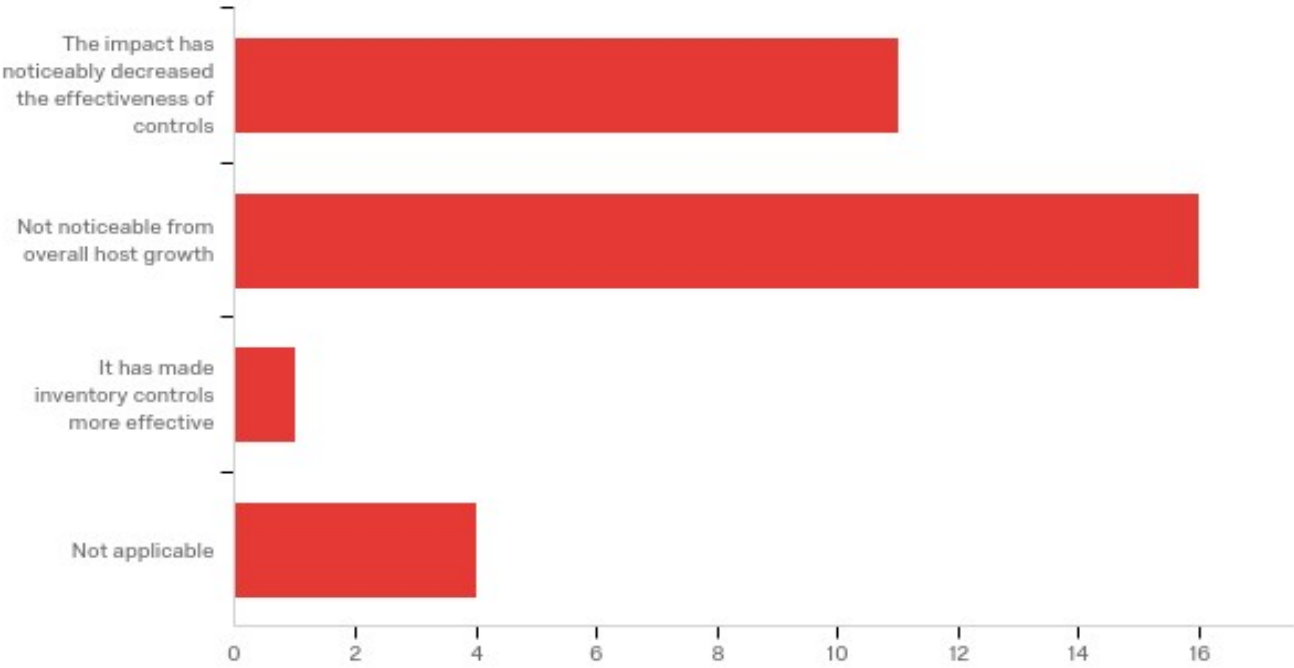
#	Answer	%	Count
1	It has decreased significantly	21.88%	7
2	It has decreased slightly	18.75%	6
3	No change	28.13%	9
4	Increased slightly	21.88%	7
5	Increased significantly	6.25%	2
6	Not applicable	3.13%	1
	Total	100%	32

**Has the effectiveness of your network’s host inventory controls been impacted with increases in the number of embedded devices or IoT hosts in the past five years?**



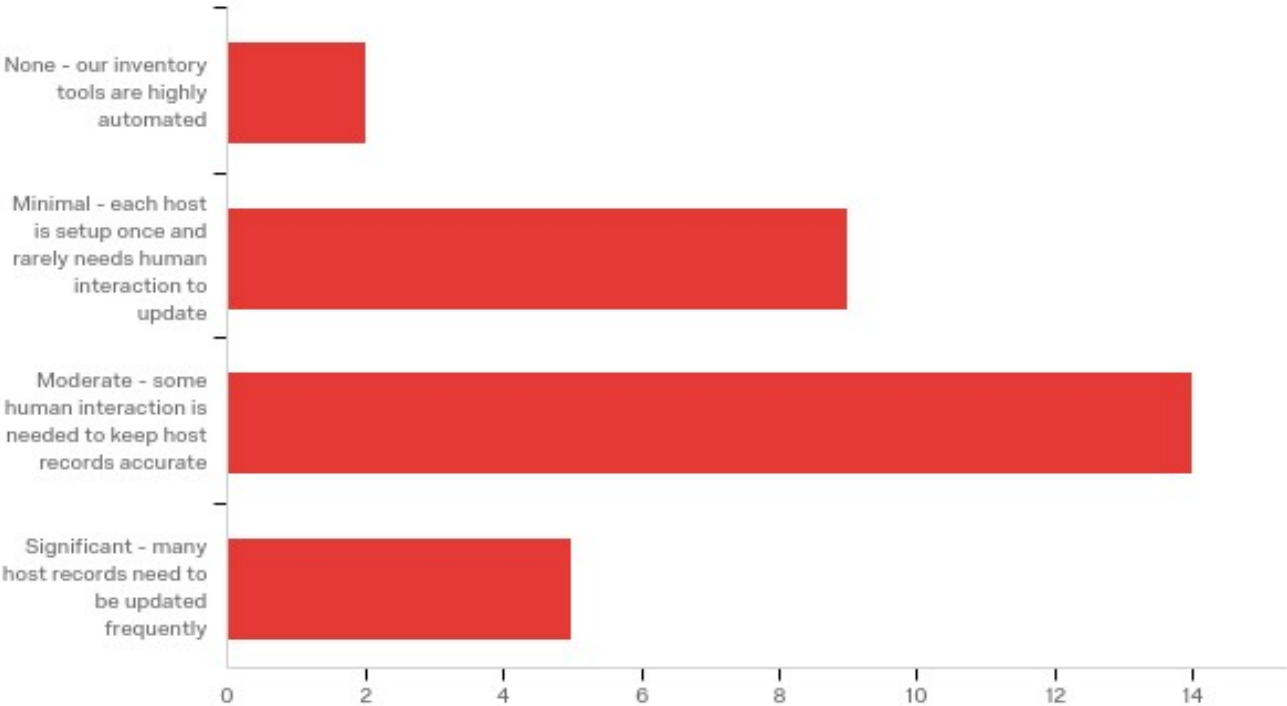
#	Answer	Count
2	Not noticeable from overall host growth	19
1	The impact has noticeably decreased the effectiveness of controls	8
4	Not applicable	3
3	It has made inventory controls more effective	1
	Total	31

**Has the effectiveness of your network’s host inventory controls been impacted with increases in the number of BYOD (non-institutionally owned) hosts in the past five years?**



#	Answer	Count
1	The impact has noticeably decreased the effectiveness of controls	11
2	Not noticeable from overall host growth	16
3	It has made inventory controls more effective	1
4	Not applicable	4
	Total	32

# How much time does your institution spend on initially entering and updating Host Inventory Control tools?



#	Answer	%	Count
1	None - our inventory tools are highly automated	6.25%	2
2	Minimal - each host is setup once and rarely needs human interaction to update	28.13%	9
3	Moderate - some human interaction is needed to keep host records accurate	43.75%	14
4	Significant - many host records need to be updated frequently	15.63%	5
5	Not applicable	6.25%	2
	Total	100%	32

## Does your institution have any specific challenges with host inventory controls which you'd like to share?

Does your institution have any specific challenges with host inventory cont...

We have asset inventories to track items >\$25k, but nothing for systems below that--basically considered supplies. There's no way for us to easily differentiate between university owned and byod.

We do a very poor job at host inventory

We can accurately track user-MAC on the wireless LAN, Time and PAT traversal make responding to DMCA complaints that report the gateway, time and port only, very time consuming if not impossible.

Time to audit is impossible to find.

There is no overarching inventory control in place, so many of these questions aren't very applicable. Even Institute-owned devices may be purchased by a specific department or lab, with little Institute-level oversight.

none

No

Multiple systems that are not correlated, inventories controlled by different groups, no central database, no cam logs, no budget.

distributed nature of hosts leads to a lack of central inventory

Consistency and enforcing the use of standard prefixes for different classes of connected devices.Raising awareness of having current and correct inventory.

Central Computing operates separately from other campus orgs, thus `institution' inventory controls is difficult to provide