

ThinkPad Docking Solutions

August 2017

Docking Overview

- Docking Stations provide a fast, easy connection to peripheral devices
 - One quick connection allows you to access all the devices connected to the docking station
 - External Monitor (many docking station models support multiple monitors)
 - External Keyboard and Mouse
 - Speakers and Microphone
 - Ethernet
 - Other USB devices (such as hard drives, printers, phones)
- Docks can provide more ports than the system provides
 - Additional video and USB ports
- Most ThinkPad docking stations provide power to the system
 - USB Docks do not provide power to the system
- Some docking stations can physically secure the system to the dock



ThinkPad Docking Station Types

	Mechanical Docks	USB-C Docks	USB Docks
Graphics	Native Graphics No additional drivers required Native Graphics Performance	Native Graphics No additional drivers required Native Graphics Performance	USB Graphics (via DisplayLink) Additional drivers required Some performance impact
Audio	Native Audio No additional drivers required	USB Audio MS Windows supplies drivers	USB Audio MS Windows supplies drivers
Ethernet	Native Ethernet No additional drivers required System MAC Address	USB Ethernet Additional drivers required MAC Address pass-through (on most ThinkPad systems)	USB Ethernet Additional drivers required Dock has unique MAC address
Power	Dock provides power to the system	Dock provides power to the system	Dock does not provide power to the system
Other	Supports same operating systems that the ThinkPad system supports	Supported with Microsoft Windows	Supported with Microsoft Windows and Google Chrome
System Compatibility	ThinkPad systems with a mechanical docking connector: L Series, T Series, P50, P70, X2xx Series	ThinkPad systems with a USB-C connector: T470, T470s, T570, P51s, X270 X1 Carbon 5 th Gen, X1 Yoga 2 nd Gen, X1 Tablet, Yoga 370, ThinkPad 13 Windows	ThinkPad systems with a USB 3 Port

Docking Station Choices for 2017 ThinkPad Systems

	E470, E570 E475, E575, TP 11e Gen 4	L470, L570	T470, T470s T570, P51s	T470p	X270	X1 Carbon, X1 Yoga, Yoga 370	X1 Tablet Gen 1 & 2	P51, P71	ThinkPad 13 Gen 2
Mechanical Docks									
40A00090US ThinkPad Basic Dock - 90W		Yes	Yes	Note 1	Yes				
40A10090US ThinkPad Pro Dock - 90W		Yes	Yes	Note 1	Yes				
40A20090US ThinkPad Ultra Dock - 90W		Yes	Yes	Note 1	Yes				
40A20170US ThinkPad Ultra Dock - 170W		Yes	Yes	Yes	Yes				
40A50230US ThinkPad Workstation Dock								Yes	
USB-C Docks									
40A90090US ThinkPad USB-C Dock			Yes		Yes	Yes	Yes		Windows Only
40AC0135US ThinkPad Thunderbolt Dock			Yes			Yes			
USB Docks									
40AA0045US ThinkPad USB 3.0 Basic Dock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40A70045US ThinkPad USB 3.0 Pro Dock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40A80045US ThinkPad USB 3.0 Ultra Dock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OneLink+ Dock									
40A40090US ThinkPad OneLink+ Dock							Note 2		Windows Only

Note 1 – Only supports T470p models with Intel graphics. Does not support T470p Models with Discrete Graphics

Note 2 - ThinkPad X1 Tablet will support the ThinkPad OneLink+ Dock when using the X1 Tablet Productivity Module

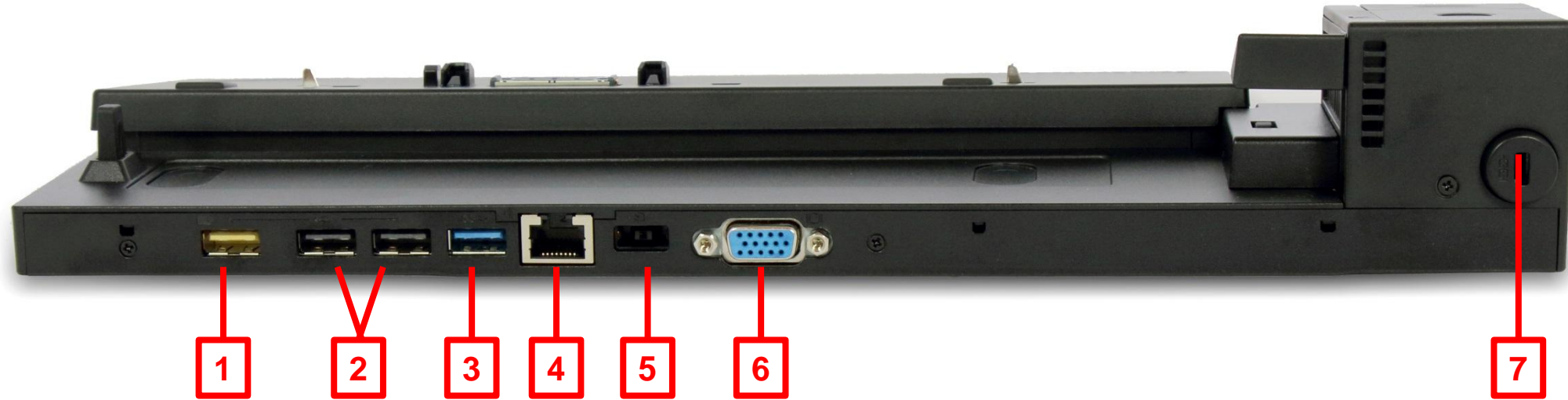
ThinkPad Mechanical Docks

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ThinkPad Mechanical Docks

	ThinkPad Basic Dock - 90W 40A00090US	ThinkPad Pro Dock 90W 40A10090US	ThinkPad Ultra Dock - 90W 40A20090US	ThinkPad Ultra Dock -170W 40A20170US	ThinkPad Workstation Dock 40A50230US
Monitor(s)	Supports 1 External Monitor	Supports 2 External Monitors	Supports 3 External Monitors	Supports 3 External Monitors	Supports 3 External Monitors
Video Ports	Video 1: 1 VGA (analog)	Video 1: 1 VGA (analog) Video 2: 1 DVI-D (digital only) Video 2: 1 DisplayPort Only 1 digital port can be active	Video 1: 1 VGA (analog) Video 2: 1 DVI-D (digital only) Video 2: 1 DisplayPort Video 3: 1 HDMI (digital only) Video 3: 1 DisplayPort Only 2 digital ports can be active	Video 1: 1 VGA (analog) Video 2: 1 DVI-D (digital only) Video 2: 1 DisplayPort Video 3: 1 HDMI (digital only) Video 3: 1 DisplayPort Only 2 digital ports can be active	Video 1: 1 VGA (analog) Video 2: 1 DVI-D (digital only) Video 2: 1 DisplayPort Video 3: 1 HDMI (digital only) Video 3: 1 DisplayPort Only 2 digital ports can be active
USB Ports	1 USB 3.0 3 USB 2.0	3 USB 3.0 3 USB 2.0	3 USB 3.0 3 USB 2.0	3 USB 3.0 3 USB 2.0	3 USB 3.0 3 USB 2.0
Ethernet	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)
Audio	None	Headphone/Microphone combo	Headphone/Microphone combo	Headphone/Microphone combo	Headphone/Microphone combo
Security	Kensington cable lock slot	Key lock Kensington cable lock slot	Key lock Kensington cable lock slot	Key lock Kensington cable lock slot	Key lock Kensington cable lock slot
Power	Includes 90W AC Adapter	Includes 90W AC Adapter	Includes 90W AC Adapter	Includes 170W AC Adapter	Includes 230W AC Adapter
Warranty	1-Year Limited	1-Year Limited	1-Year Limited	1-Year Limited	1-Year Limited
List Price	\$199.99	\$249.99	\$269.99	\$299.99	\$299.99
Supported Systems	L460, L560, L470, L570 T460, T460s, T470, T470s T460p (integrated graphics) T470p (integrated graphics) T560, T570 P50s, P51s, X260, X270	L460, L560, L470, L570 T460, T460s, T470, T470s T460p (integrated graphics) T470p (integrated graphics) T560, T570 P50s, P51s, X260, X270	L460, L560, L470, L570 T460, T460s, T470, T470s T460p (integrated graphics) T470p (integrated graphics) T560, T570 P50s, P51s, X260, X270	L460, L560, L470, L570 T460, T460s, T470, T470s T460p (all models) T470p (all models) T560, T570 P50s, P51s, X260, X270	P50, P51 P70, P71

ThinkPad Basic Dock - 40A00090US



- 1 – USB 2.0 powered
- 2 – USB 2.0
- 3 – USB 3.0
- 4 – RJ-45 Gigabit Ethernet

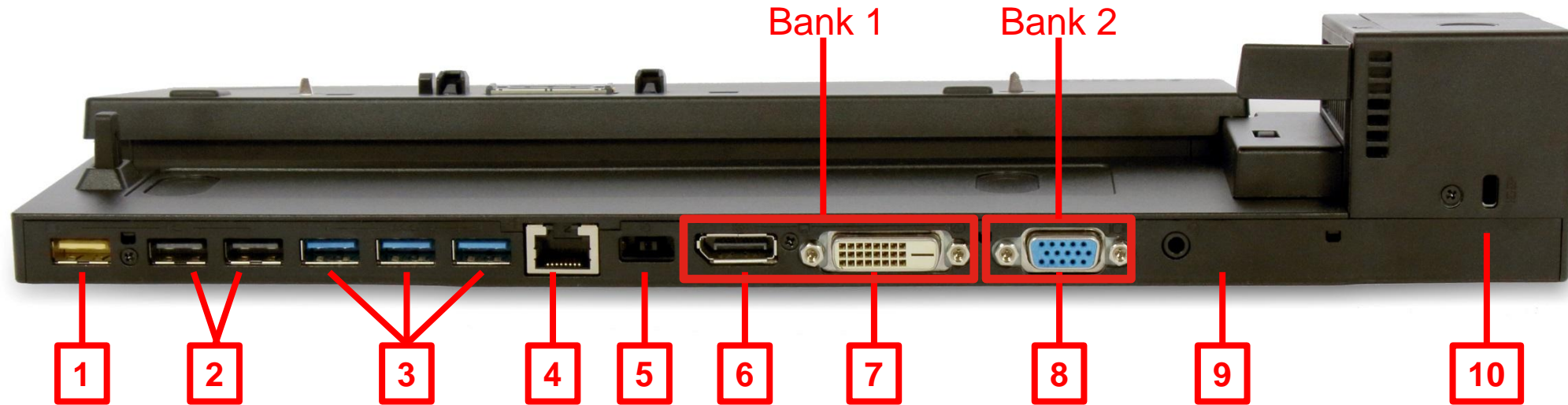
- 5 – AC adapter input
- 6 – VGA monitor port
- 7 – Cable lock slot

Notes:

- No Audio ports
- No Notebook lock to secure notebook in the dock
- Includes 90W AC Power Adapter
- 40A00090US - ThinkPad Basic Dock – 90W



ThinkPad Pro Dock - 40A10090US



- 1 – USB 2.0 powered
- 2 – USB 2.0
- 3 – USB 3.0
- 4 – RJ-45 Gigabit Ethernet

- 5 – AC adapter input
- 6 – DisplayPort connector
- 7 – DVI-D connector
- 8 – VGA monitor port

- 9 – Headphone/Microphone combo
- 10 – Kensington security lock slot

Notes:

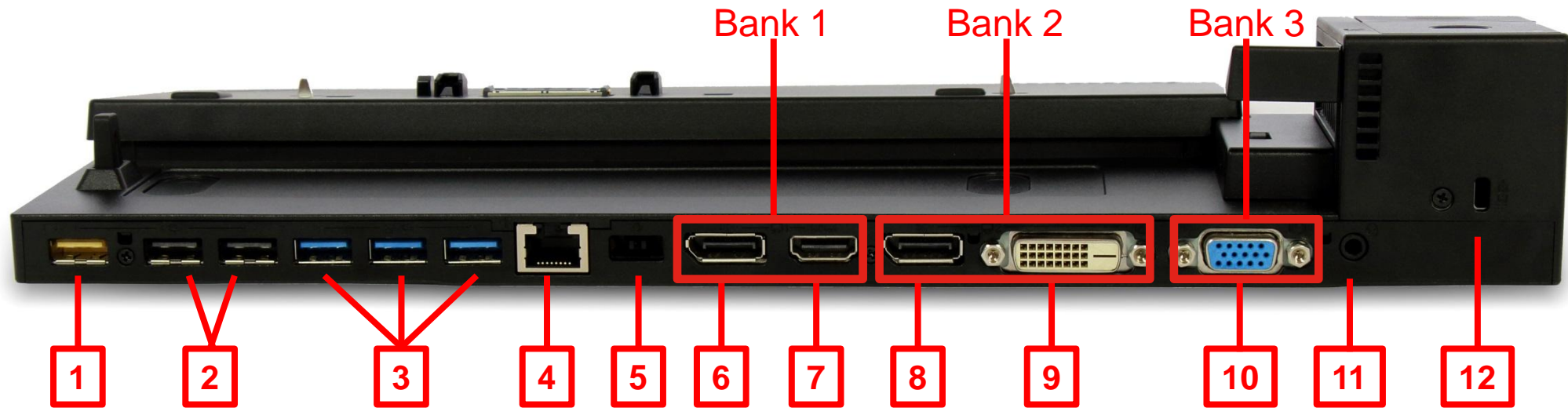
- Includes 90W AC Adapter
- Key lock secures notebook to the Pro Dock
- 40A10090US - ThinkPad Pro – 90W



ThinkPad Pro Dock – Maximum Resolution

	Bank 1 - DisplayPort	Bank 1 - DVI-D Port	Bank 2 – VGA Port
1 Display	3840 x 2160 @60Hz		
		1920 x 1200 @60Hz	
			1920 x 1200 @60Hz
2 Displays	3840 x 2160 @60Hz		1920 x 1200 @60Hz
		1920 x 1200 @60Hz	1920 x 1200 @60Hz

ThinkPad Ultra Dock - 40A20090US & 40A20170US



- 1 – USB 2.0 powered
- 2 – USB 2.0
- 3 – USB 3.0
- 4 – RJ-45 Gigabit Ethernet
- 5 – AC adapter input

- 6 – DisplayPort connector (Display 1)
- 7 – HDMI connector (Display 1)
- 8 – DisplayPort connector (Display 2)
- 9 – DVI-D monitor port (Display 2)
- 10 – VGA monitor port (Display 3)

- 11 – Headphone/Microphone combo
- 12 – Kensington security lock slot

Notes:

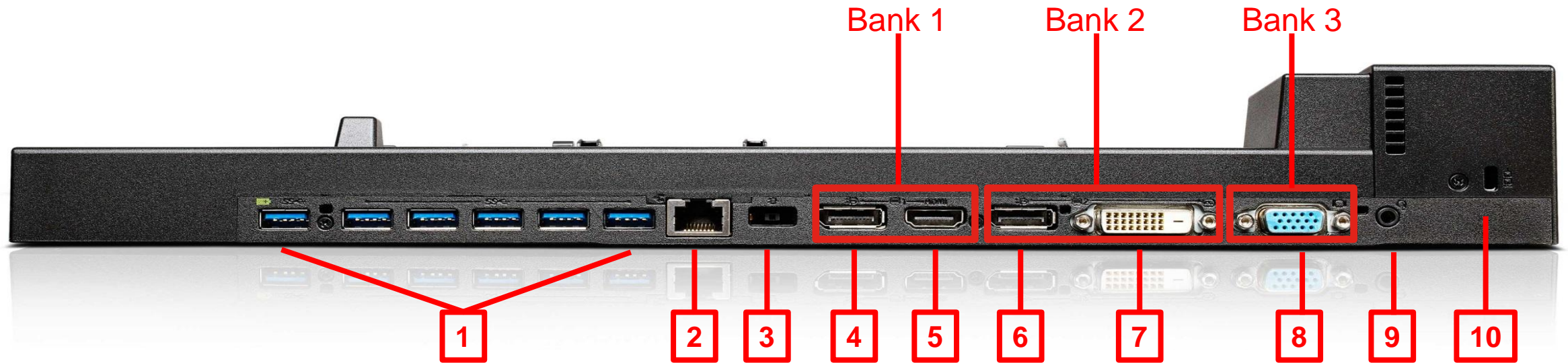
- Key lock secures notebook to the Pro Dock
- 40A20090US ThinkPad Ultra Dock – 90W -- Includes 90W AC Adapter
- 40A20170US ThinkPad Ultra Dock – 170W -- Includes 170W AC Adapter



ThinkPad Ultra Dock – Maximum Resolution

	Bank 1 DisplayPort #1	Bank 1 HDMI Port	Bank 2 DisplayPort #2	Bank 2 DVI-D Port	Bank 3 VGA Port
1 Display	3840 x 2160 @60Hz				
		3840 x 2160 @30Hz			
			3840 x 2160 @60Hz		
				1920 x 1200 @60Hz	
					1920 x 1200 @60Hz
2 Displays	3840 x 2160 @30Hz		3840 x 2160 @30Hz		
	3840 x 2160 @60Hz			1920 x 1200 @60Hz	
	3840 x 2160 @60Hz				1920 x 1200 @60Hz
		3840 x 2160 @30Hz	3840 x 2160 @30Hz		
		3840 x 2160 @30Hz		1920 x 1200 @60Hz	
		3840 x 2160 @30Hz			1920 x 1200 @60Hz
			3840 x 2160 @60Hz		1920 x 1200 @60Hz
				1920 x 1200 @60Hz	1920 x 1200 @60Hz
3 Displays	3840 x 2160 @30Hz		3840 x 2160 @30Hz		1024 x 768 @60Hz
	1920 x 1200 @60Hz			1920 x 1200 @60Hz	1920 x 1200 @60Hz
		3840 x 2160 @30Hz	3840 x 2160 @30Hz		1024 x 768 @60Hz
		1920 x 1200 @60Hz		1920 x 1200 @60Hz	1920 x 1200 @60Hz

ThinkPad Workstation Dock - 40A50230US



- 1 – USB 3.0
- 2 – RJ-45 Gigabit Ethernet
- 3 – AC adapter input

- 4 – DisplayPort connector (Display 1)
- 5 – HDMI connector (Display 1)
- 6 – DisplayPort connector (Display 2)
- 7 – DVI-D monitor port (Display 2)
- 8 – VGA monitor port (Display 3)

- 9 – Headphone/Microphone combo
- 10 – Kensington security lock slot

Notes:

- Key lock secures notebook to the Pro Dock
- Includes 230W AC Adapter

ThinkPad Workstation Dock – Maximum Resolution

	Bank 1 DisplayPort #1	Bank 1 HDMI Port	Bank 2 DisplayPort #2	Bank 2 DVI-D Port	Bank 3 VGA Port
1 Display	3840 x 2160 @60Hz				
		3840 x 2160 @30Hz			
			3840 x 2160 @60Hz		
				1920 x 1200 @60Hz	
					1920 x 1200 @60Hz
2 Displays	3840 x 2160 @30Hz		3840 x 2160 @30Hz		
	3840 x 2160 @60Hz			1920 x 1200 @60Hz	
	3840 x 2160 @60Hz				1920 x 1200 @60Hz
		3840 x 2160 @30Hz	3840 x 2160 @30Hz		
		3840 x 2160 @30Hz		1920 x 1200 @60Hz	
		3840 x 2160 @30Hz			1920 x 1200 @60Hz
			3840 x 2160 @60Hz		1920 x 1200 @60Hz
				1920 x 1200 @60Hz	1920 x 1200 @60Hz
3 Displays	3840 x 2160 @30Hz		3840 x 2160 @30Hz		1024 x 768 @60Hz
	1920 x 1200 @60Hz			1920 x 1200 @60Hz	1920 x 1200 @60Hz
		3840 x 2160 @30Hz	3840 x 2160 @30Hz		1024 x 768 @60Hz
		1920 x 1200 @60Hz		1920 x 1200 @60Hz	1920 x 1200 @60Hz

ThinkPad USB-C Docks

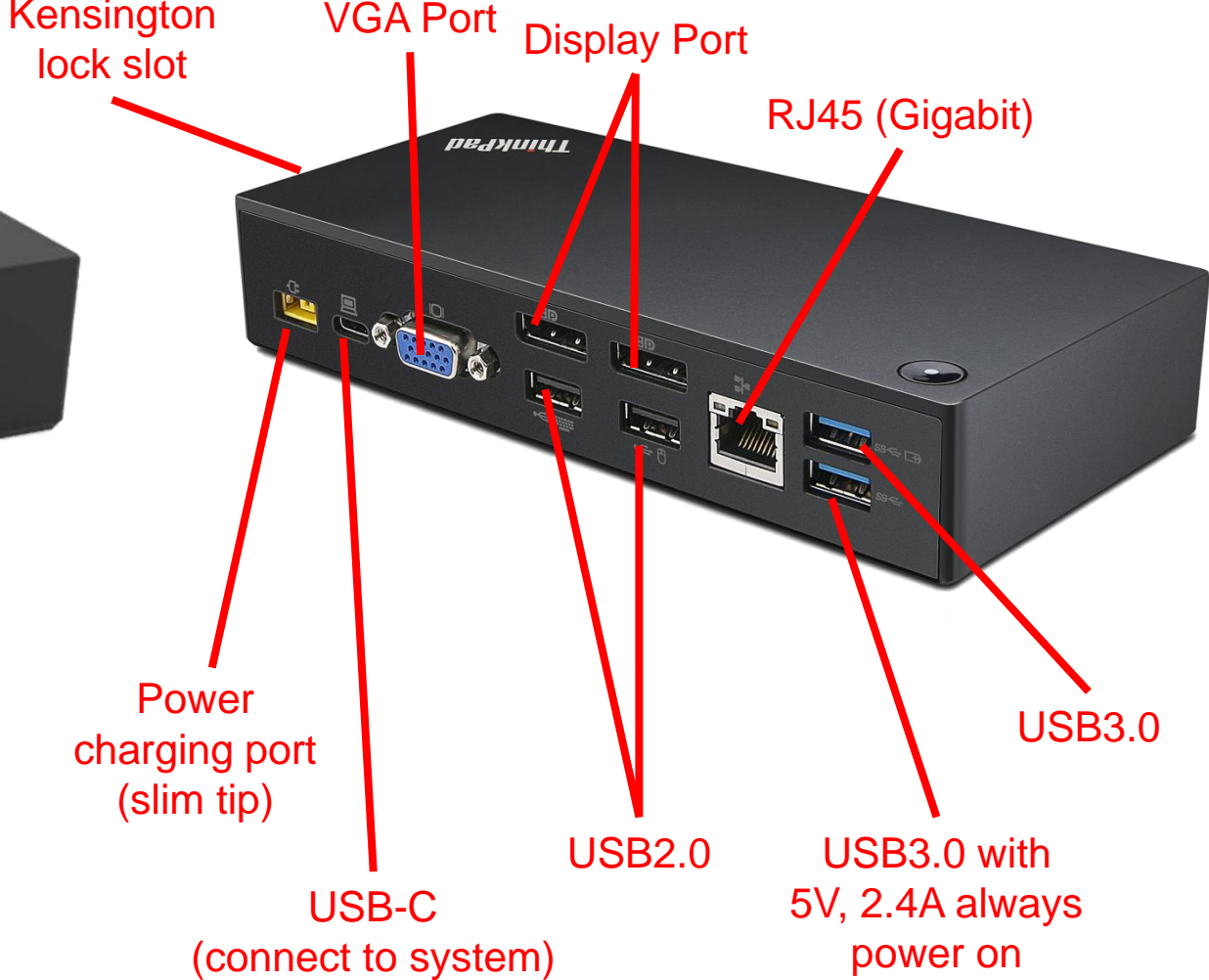
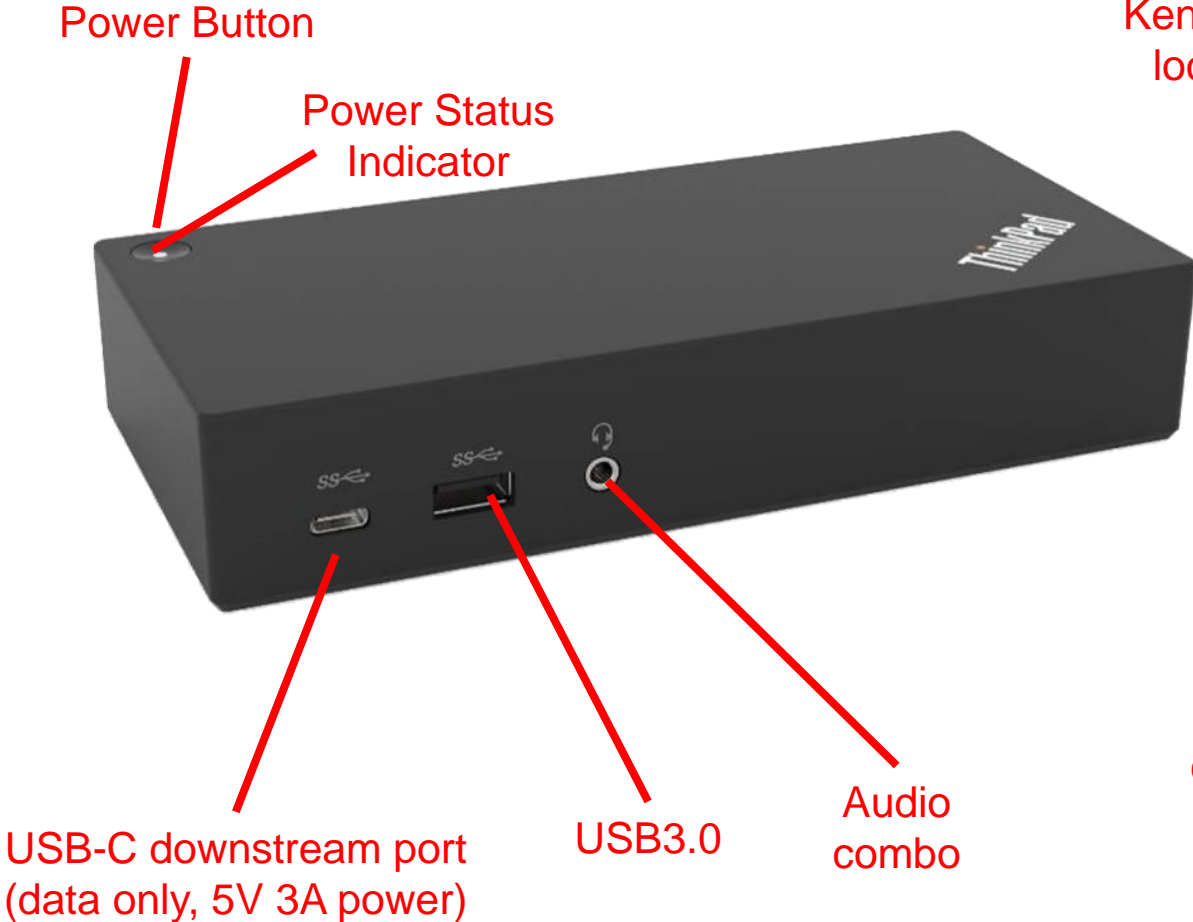
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ThinkPad USB-C Docking Line

	ThinkPad USB-C Dock 40A90090US	ThinkPad Thunderbolt Dock 40AC0135US
External Monitor	Supports 2 External Monitors	Supports 3 External Monitors
Video Ports	2 DisplayPort, 1 VGA Port Only 2 ports can be active	2 DisplayPort, 1 HDMI Port, 1 VGA Port Only 3 ports can be active
USB Ports	1 USB-C Port 3 USB 3.0 Ports 2 USB 2.0 Ports	1 USB-C Port 5 USB 3.0 Ports
Ethernet	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)
Front Audio	Headphone/Microphone combo	Headphone/Microphone combo
Security	Kensington cable lock slot	Kensington cable lock slot
Power Adapter	Includes 90W AC Adapter (Slim Tip)	Includes 135W AC Adapter (Slim Tip)
Warranty	3-Year Limited	3-Year Limited
List Price	\$199.99	\$279.99
Supported Systems	T470, T470s, T570, P51s X1 Carbon 5 th Gen, X1 Yoga 2 nd Gen X270, Yoga 370 X1 Tablet 1 st Gen, X1 Tablet 2 nd Gen ThinkPad 13 1 st Gen Windows Models ThinkPad 13 2 nd Gen Windows Models	T470, T470s, T570, P51s X1 Carbon 5 th Gen, X1 Yoga 2 nd Gen Yoga 370

On most supported ThinkPad systems, both the ThinkPad USB-C Dock and the ThinkPad Thunderbolt Dock support PXE Boot, Wake on LAN, and MAC Address Pass-through. See backup section for more details

ThinkPad USB-C Dock - 40A90090US

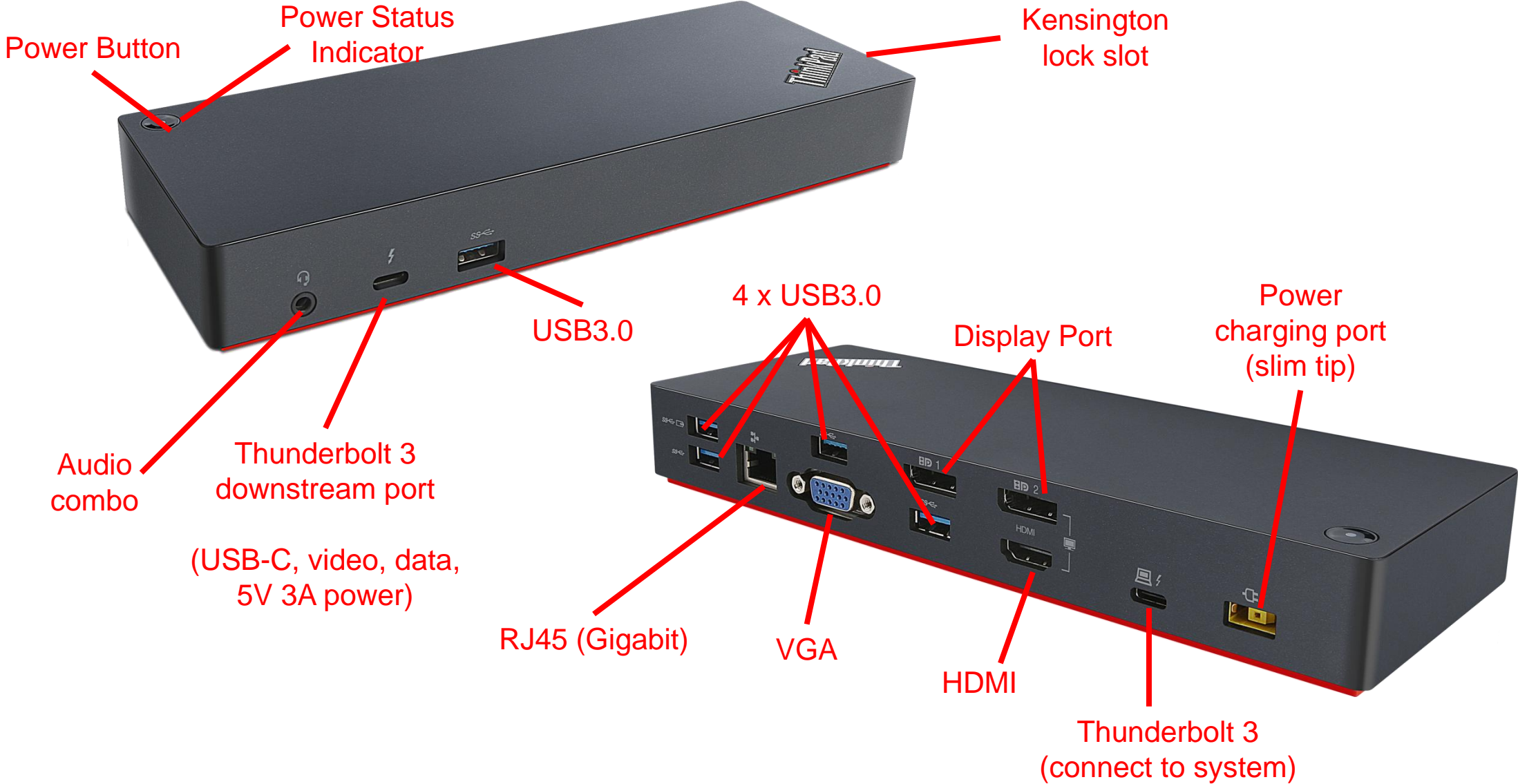


***Does not support video output**

ThinkPad USB-C Dock – Maximum Resolution

	DisplayPort #1	DisplayPort #2	VGA Port
1 Display	3840 x 2160 @30Hz		
			1920 x 1200 @60Hz
2 Displays	1920 x 1080 @60Hz	1920 x 1080 @60Hz	
	1920 x 1080 @60Hz		1920 x 1080 @60Hz
		1920 x 1080 @60Hz	1920 x 1080 @60Hz

ThinkPad Thunderbolt Dock - 40AC0135US



ThinkPad Thunderbolt 3 Dock – Maximum Resolution

	NB Built-in LCD	DisplayPort #1	DisplayPort #2 / HDMI (only 1 can be active)	VGA Port	Thunderbolt Downstream*	Remark
1 display	-	3840 x 2160 @60Hz				
	-		DP2: 3840 x 2160 @60Hz or HDMI: 3840 x 2160 @30Hz			
	-			1920 x 1200 @60Hz		
	-				3840x2160 @60Hz	
2 displays	ON	3840 x 2160 @60Hz				
	ON		DP2: 3840 x 2160 @60Hz or HDMI: 3840 x 2160 @30Hz			
	ON			1920 x 1200 @60Hz		
	ON				3840x2160 @60Hz	
	-	3840 x 2160 @30Hz	3840 x 2160 @30Hz			
	-	3840 x 2160 @30Hz		1920 x 1200 @60Hz		
	-		3840 x 2160 @30Hz	1920 x 1200 @60Hz		
				1920 x 1200 @60Hz	3840x2160 @60Hz	
	-	3840 x 2160 @60Hz			3840 x 2160 @60Hz	
	-		3840 x 2160 @60Hz or HDMI: 3840 x 2160 @30Hz		3840 x 2160 @60Hz	Only able to be supported by X1 Carbon 5th Gen & X1 Yoga 2nd Gen
3 displays	-		3840 x 2160 @30Hz	1920 x 1200 @60Hz	3840 x 2160 @60Hz	
		3840 x 2160 @30Hz		1920 x 1200 @60Hz	3840 x 2160 @60Hz	
	-	3840 x 2160 @30Hz	3840 x 2160 @30Hz		3840 x 2160 @60Hz	
	-	2560 x 1600 @60Hz	1920 x 1080 @60Hz	1920 x 1080 @60Hz		
	-	3840 x 2160 @30Hz	1920 x 1080 @60Hz	1920 x 1080 @60Hz		

* For Thunderbolt Downstream, a USB-C to DisplayPort Adapter (4X90L66916) must be connected to the front Thunderbolt port

ThinkPad System Thunderbolt Support

	X1 Carbon Gen 5 X1 Yoga Gen 2	T470, T470s, T570 Yoga 370, P51s
Thunderbolt Chipset	DP	LP
Thunderbolt Dock 4K Monitor Support	Two 3840 x 2160 @60Hz (via one DisplayPort and one Thunderbolt Port) Requires no display on system HDMI port and 2 nd TBT port	One 3840 x 2160 @60Hz (via either DisplayPort or Thunderbolt port) Or Two 3840 x 2160 @30Hz (via either DisplayPort or HDMI)
Thunderbolt Dock Data Support	Up to 22 Gbps	Up to 11 Gbps

Note:

- For dual 3840 x 2160 @30Hz displays, connect the monitors to the DisplayPort & HDMI ports at rear of the dock
- For dual 3840 x 2160 @60Hz displays, one monitor must be connected to the Thunderbolt port in front of the Dock. A USB-C to DisplayPort Adapter (4X90L66916) will be required

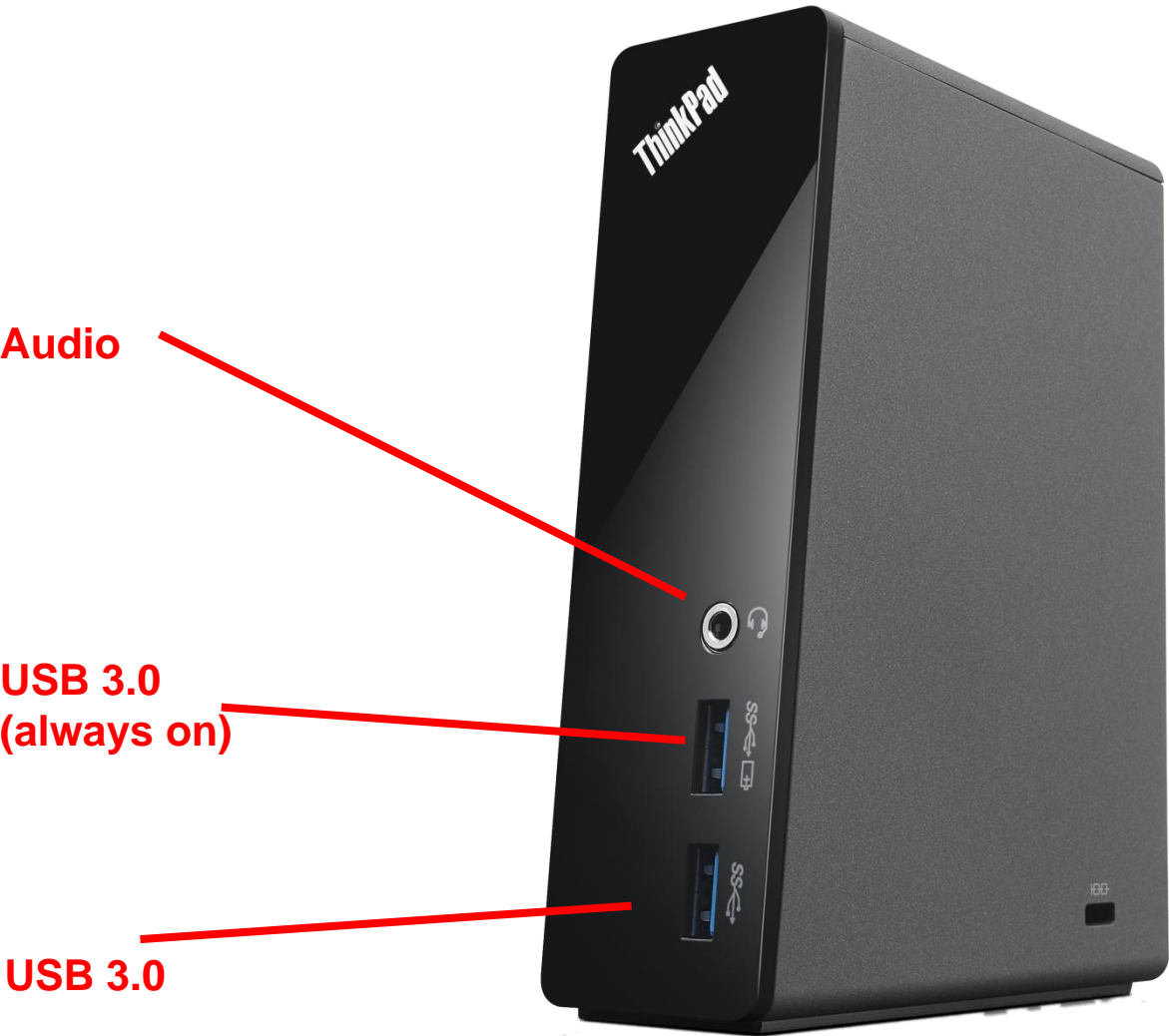
ThinkPad USB Docks

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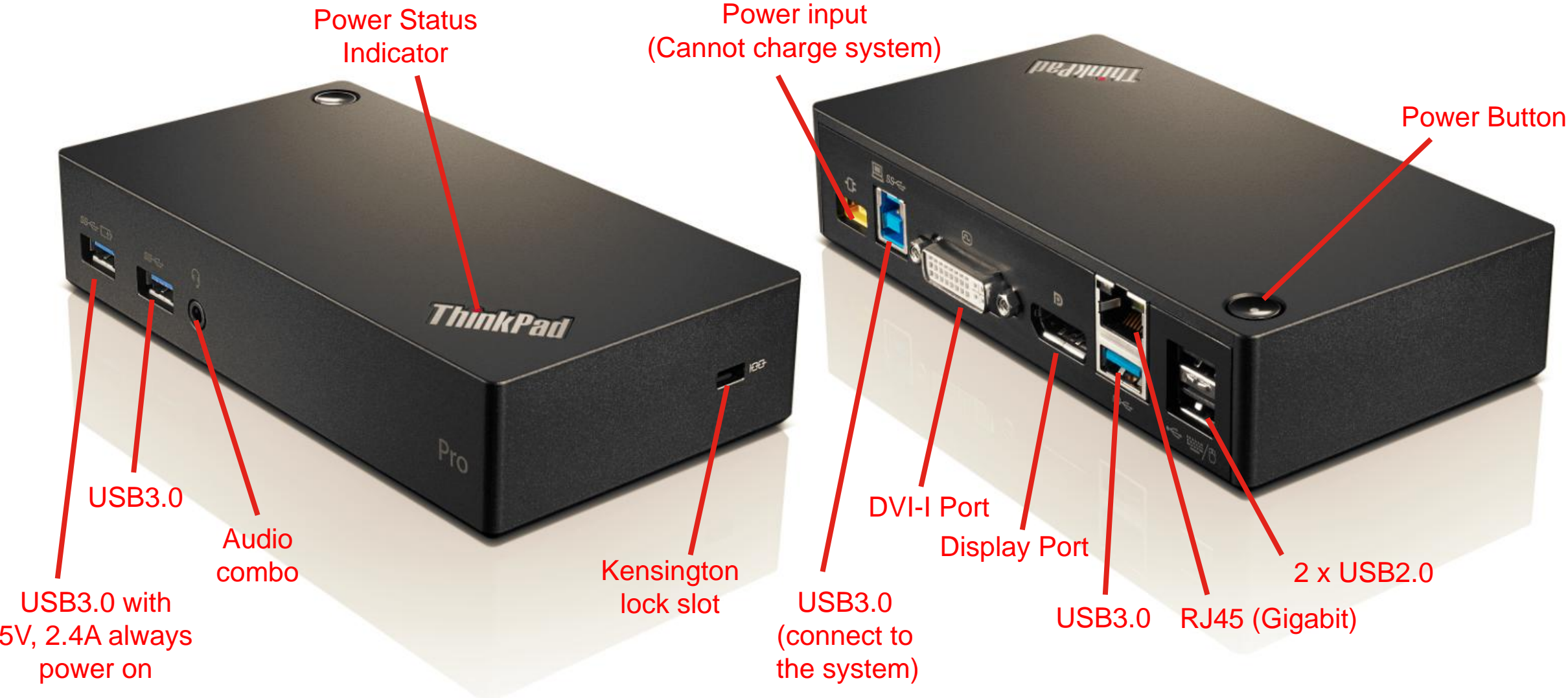
ThinkPad USB Docking Line

	ThinkPad USB 3.0 Basic Dock 40AA0045US	ThinkPad USB 3.0 Pro Dock 40A70045US	ThinkPad USB 3.0 Ultra Dock 40A80045US
External Monitor	Supports 1 External Monitor	Supports 2 External Monitors	Supports 2 External Monitors
Video Ports	Video 1: 1 DVI-I (includes DVI to VGA adapter)	Video 1: 1 DVI-I Video 2: 1 DisplayPort (includes DVI to VGA adapter)	Video 1: 1 DisplayPort Video 2: 1 HDMI port
Max Video Resolution			
1 Monitor	1920 x 1200 @ 60Hz via DVI	2560 x 1600 @ 60Hz via DisplayPort	3840 x 2160 @ 30Hz via DisplayPort
2 Monitors		1920 x 1200 @ 60Hz	1920 x 1200 @ 60Hz
Front USB Ports	2 USB 3.0 ports	2 USB 3.0 ports	2 USB 3.0 ports
Rear USB Ports	2 USB 2.0 ports	1 USB 3.0 port 2 USB 2.0 ports	2 USB 3.0 ports 2 USB 2.0 ports
Ethernet	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)	Gigabit (RJ-45 Port)
Front Audio	Headphone/Microphone combo	Headphone/Microphone combo	Headphone/Microphone combo
Security	Kensington cable lock slot	Kensington cable lock slot	Kensington cable lock slot
Power Adapter	ThinkPad 45W Slim AC Adapter (Slim Tip) Powers the USB Dock, not the system	ThinkPad 65W Slim AC Adapter (Slim Tip) Powers the USB Dock, not the system	ThinkPad 65W Slim AC Adapter (Slim Tip) Powers the USB Dock, not the system
Warranty	1-Year Limited	3-Year Limited	3-Year Limited
List Price	\$99.99	\$179.99	\$199.99

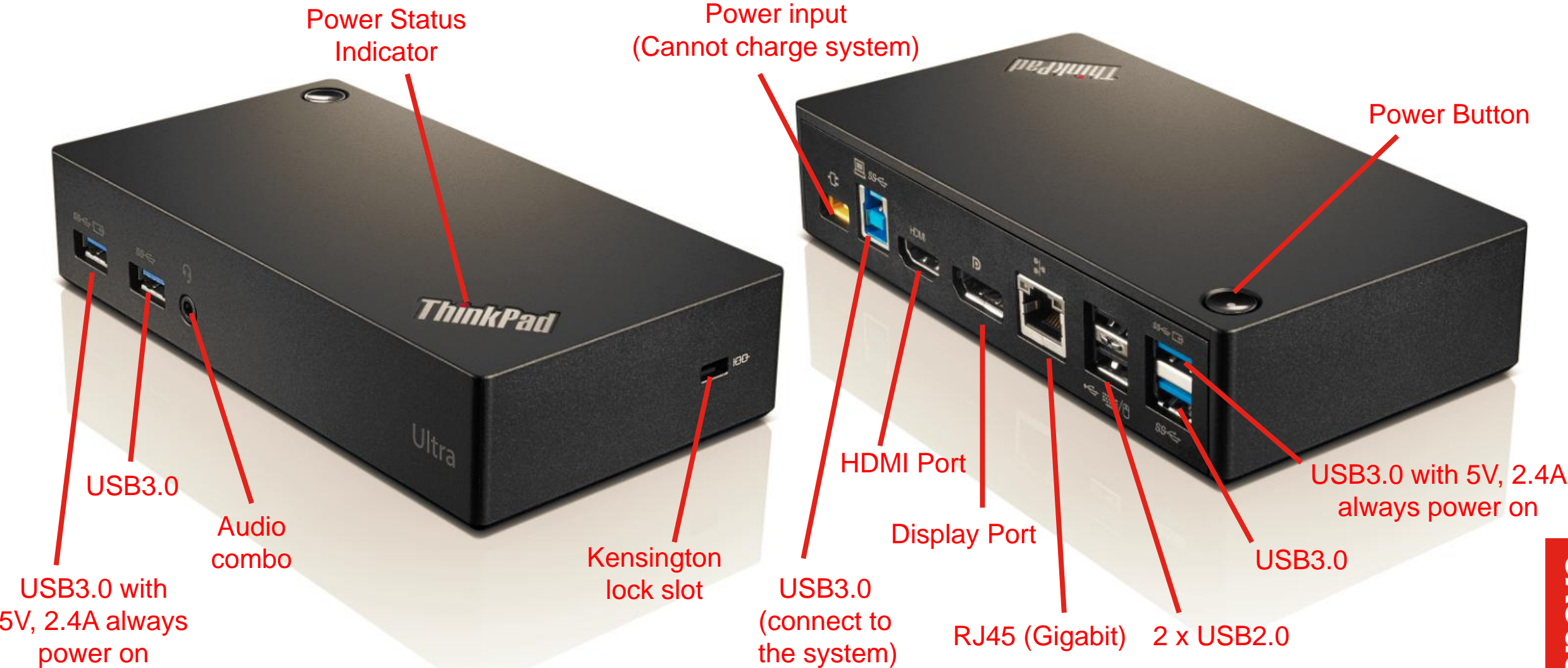
ThinkPad USB 3.0 Basic Dock - 40AA0045US



ThinkPad USB 3.0 Pro Dock - 40A70045US



ThinkPad USB 3.0 Ultra Dock - 40A80045US



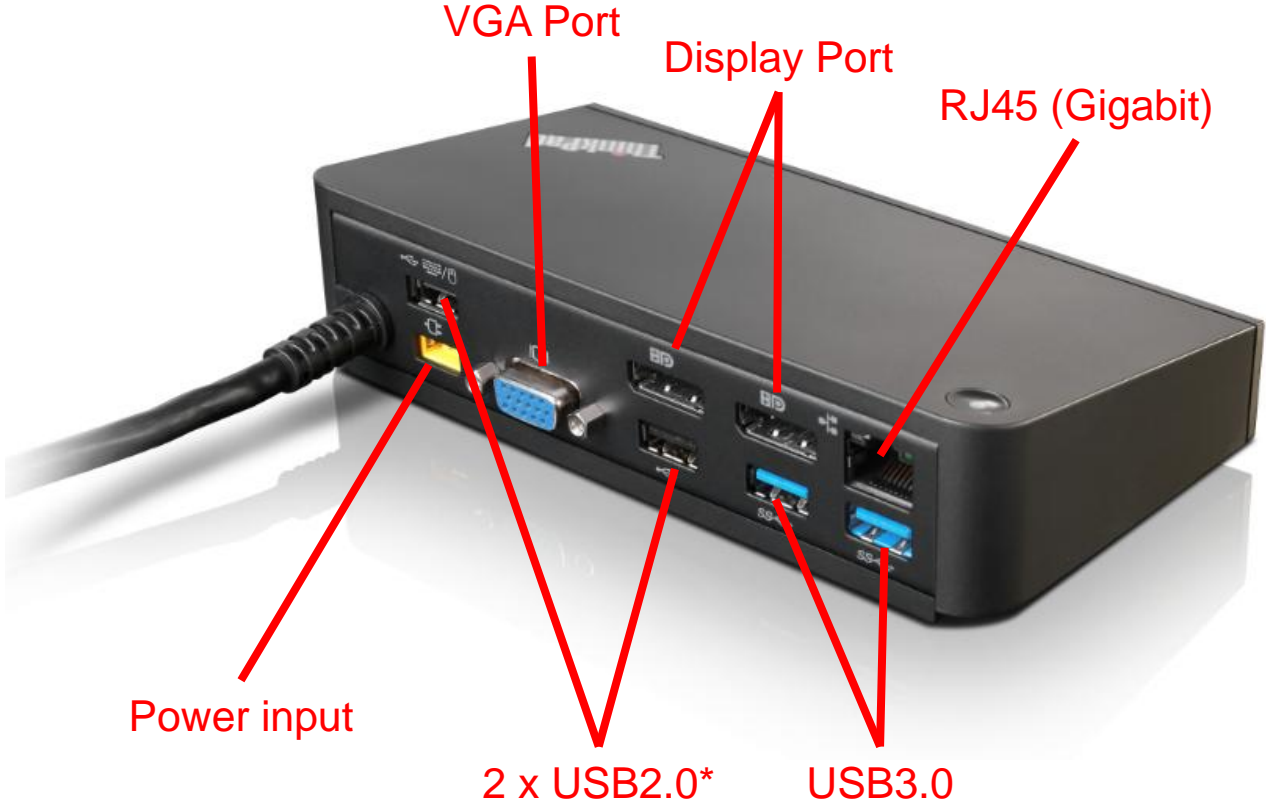
ThinkPad OneLink+ Dock

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ThinkPad OneLink+ Dock

	ThinkPad OneLink+ Dock 40A40090US
External Monitor	Supports 3 External Monitors
Video Ports	Video 1: DisplayPort Video 2: DisplayPort Video 3: VGA
Front USB Ports	2 USB 3.0 ports
Rear USB Ports	2 USB 3.0 ports 2 USB 2.0 ports
Ethernet	Gigabit (RJ-45 Port)
Front Audio	Headphone/Microphone combo
Security	Kensington cable lock slot
Power Adapter	Includes 90W AC Adapter (Slim Tip)
Warranty	1-Year Limited
List Price	\$179.99
Supported Systems	X1 Tablet 1 st Gen (requires Productivity Module) X1 Tablet 2 nd Gen (requires Productivity Module) Yoga 260 ThinkPad 13 1 st Gen Windows Models ThinkPad 13 2 nd Gen Windows Models

ThinkPad OneLink+ Dock – 40A40090US



ThinkPad OneLink+ Dock – Maximum Resolution

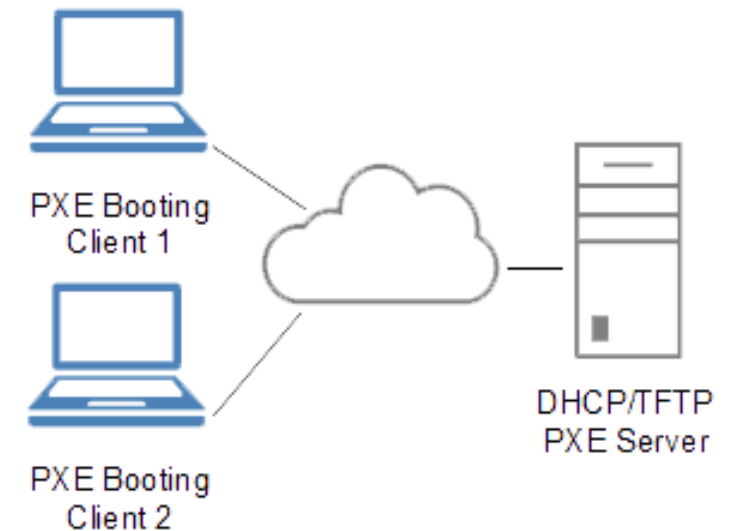
	DisplayPort #1	DisplayPort #2	VGA Port
1 display	3840 x 2160 @60Hz		
			1920 x 1200 @60Hz
2 displays	3840 x 2160 @60Hz	1024 x 768 @60Hz	
	3840 x 2160 @30Hz	3840 x 2160 @30Hz	
	3840 x 2160 @60Hz		1024 x 768 @60Hz
	3840 x 2160 @30Hz		1920 x 1200 @60Hz
3 displays	3840 x 2160 @30Hz	3840 x 2160 @30Hz	1024 x 768 @60Hz
	1920 x 1200 @60Hz	1920 x 1200 @60Hz	1920 x 1200 @60Hz

Backup

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PXE Boot & WOL

- Preboot execution environment (PXE) allows computers to boot up remotely through a network interface. PXE enables a client machine to boot from a server independent of the internal hard drive or SSD and the installed operating system
 - Many customers use PXE to boot the system for the first time and allow IT to load the software image onto the system
- Wake-on-LAN (WOL) is an industry standard protocol for waking computers up remotely. This allows the IT manager to boot up the system and install software images / updates remotely



MAC Address Pass-through

- Network security and remote system management requires that we be able to identify the specific system. This is typically accomplished via the system's MAC Address
 - A media access control address (MAC address) of a computer is a unique identifier assigned to network interface. MAC addresses are assigned by the manufacturer of the network interface controller and are stored in its hardware
- Docks with a USB Ethernet solution have their own MAC address. Any device using that dock would report the MAC address of the Dock (rather than the MAC address of the system)
- New 2017 ThinkPad systems will provide a MAC address pass-through capability. When the system is connected to a ThinkPad USB-C Dock or Thunderbolt Dock, the system MAC address will override the dock MAC address.
 - This feature can be enabled or disabled in BIOS settings. It is enabled by default.



ThinkPad System Feature Support

ThinkPad System	Thunderbolt Port	PXE boot	WOL from S4/S5	MAC Address Pass-through
T470	Yes	Yes	Yes	Yes
T470s	Yes	Yes	Yes	Yes
T570	Yes	Yes	Yes	Yes
X270	No	Yes	Yes	Yes
P51s	Yes	Yes	Yes	Yes
X1 Carbon 5 th Gen	Yes	Yes	Yes	Yes
X1 Yoga 2 nd Gen	Yes	Yes	Yes	Yes
X1 Tablet 1 st Gen & 2 nd Gen	No	No	No	No
Yoga 370	Yes	Yes	Yes	Yes
ThinkPad 13 1 st Gen Windows	No	No	No	Yes
ThinkPad 13 2 nd Gen Windows	No	Yes	Yes	Yes