

AMD Threadripper Pro

Castlepeak to Chagall CPU Upgrade

Lenovo ThinkStation P620



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Overview

The introduction to the new Chagall Workstation processors expands the AMD Ryzen Threadripper Pro Series lineup. AMD and Lenovo have collaborated to enable Chagall CPU upgrades on the existing P620 platform using Castle Peak CPU. The Chagall CPU is a drop in compatible part that requires only a basic system BIOS update in order to function.

AMD Threadripper Pro Processors - Chagall					
CPU	5945WX	5955WX	5965WX	5975WX	5955WX
Base Frequency	4.1GHz	4.0GHz	3.8GHz	3.6GHz	2.7GHz
Max Boost Clock	TBD	TBD	TBD	TBD	TBD
Cores	12	16	24	32	64
Threads	24	32	48	64	128
Cache (L3)	64M	64M	128M	128M	256M
Memory Speed	3200MHz	3200MHz	3200MHz	3200MHz	3200MHz
TDP	280W	280W	280W	280W	280W

AMD Threadripper Pro Processors - Castlepeak				
CPU	3945WX	3955WX	3975WX	3995WX
Base Frequency	4.0GHz	3.9GHz	3.5GHz	2.7GHz
Max Boost Clock	4.3GHz	4.3GHz	4.2GHz	4.2GHz
Cores	12	16	32	64
Threads	24	32	64	128
Cache (L3)	64M	64M	128M	256M
Memory Speed	3200MHz	3200MHz	3200MHz	3200MHz
TDP	280W	280W	280W	280W

Step 1 – Update BIOS

Updating system BIOS is a critical first step to allow the P620 platform to support the new Chagall family of CPUs. Support for Chagall CPUs was added to BIOS in a staged approach, so it is critical that the proper flashing sequences be followed in order to ensure BIOS is updated successfully. The flash sequence will be determined by the starting BIOS that is installed on the target P620 system. Table 1 below shows the proper flash procedures based on the starting BIOS level. Note that up to two separate flash procedures might be necessary based on the starting BIOS version.

Table 1: ThinkStation P620 BIOS version update process to support Chagall processors.

If starting BIOS is < BIOS 26A...	If starting BIOS is >= 26A...
1. Flash to BIOS 26A first. Note – Refer to special instructions below if starting BIOS is 21A or 22A.	1. Flash to BIOS 45A (or latest available BIOS).
2. Flash to BIOS 45A (or latest available BIOS).	2. Proceed with physical CPU installation.
3. Proceed with physical CPU installation.	

Note: It is critical that system BIOS be upgraded successfully as highlighted above prior to the Chagall CPU installation. Otherwise, the system could fail to boot properly.

Lenovo recommends using BIOS S07KT45A (45A) or higher when using Chagall CPUs in the P620 platform.

Special Instructions for Starting BIOS 21/22A

If the starting BIOS version is BIOS S07KT21A (BIOS 21A) or S07KT22A (BIOS 22A), an additional step must be taken during the flash process to ensure it completes successfully. Follow the steps below if the starting BIOS is 21A or 22A:

1. With the system powered off, locate jumper JP55 on the P620 motherboard (see Figure 1 below).
2. Move the jumper from the default position connecting pins 1-2 to the disabled position which connects pins 2-3.
3. Run the BIOS flash update for BIOS 26A as instructed.
4. Once the flash update for 26A completes successfully, power off the system and move JP55 back to the default position connecting pins 1-2.
5. Follow the general BIOS Flash Update Procedure steps listed in the next section.

JP55 Jumper

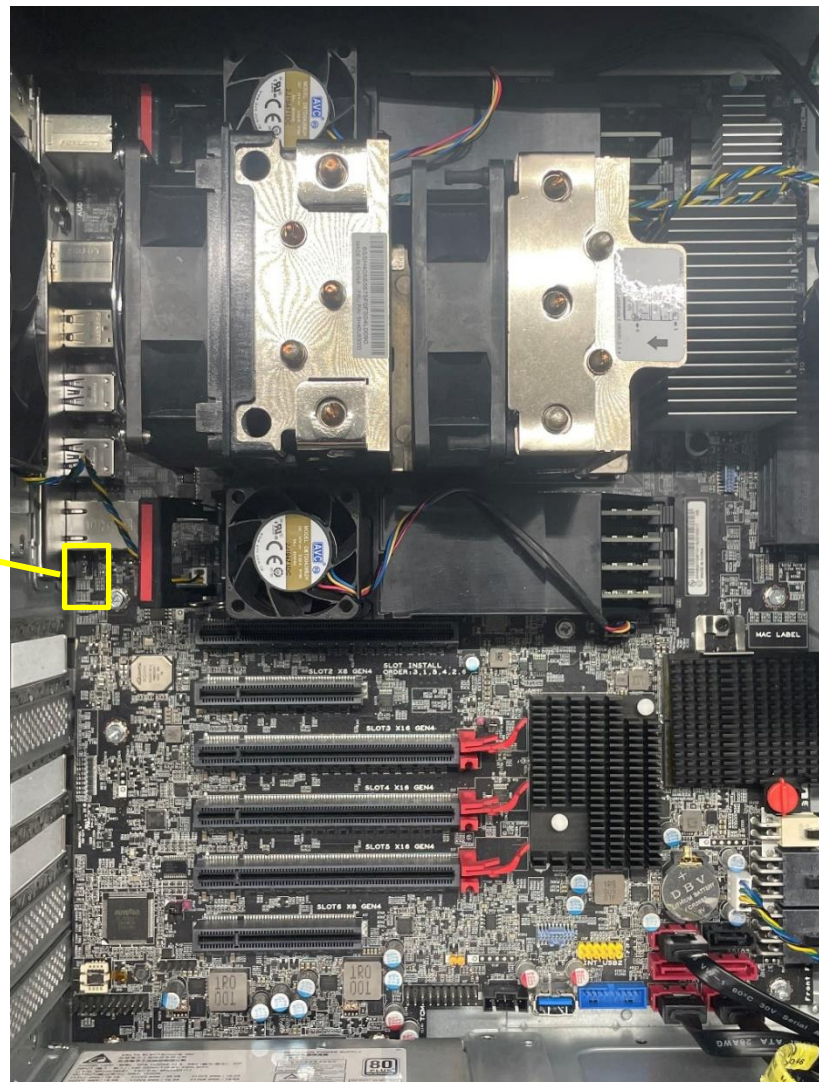
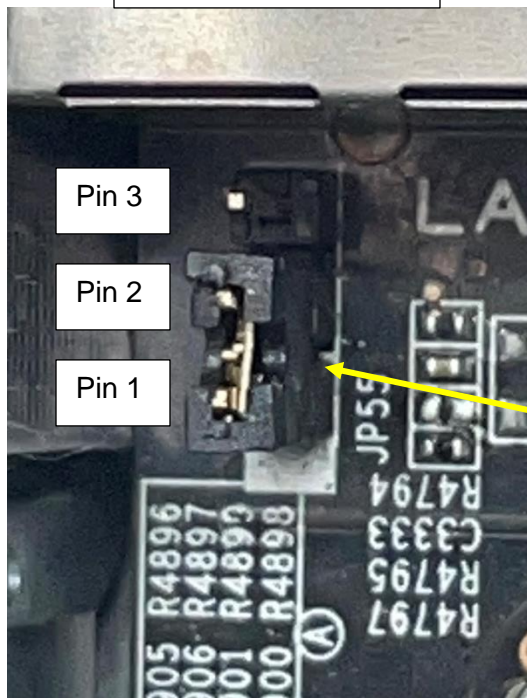
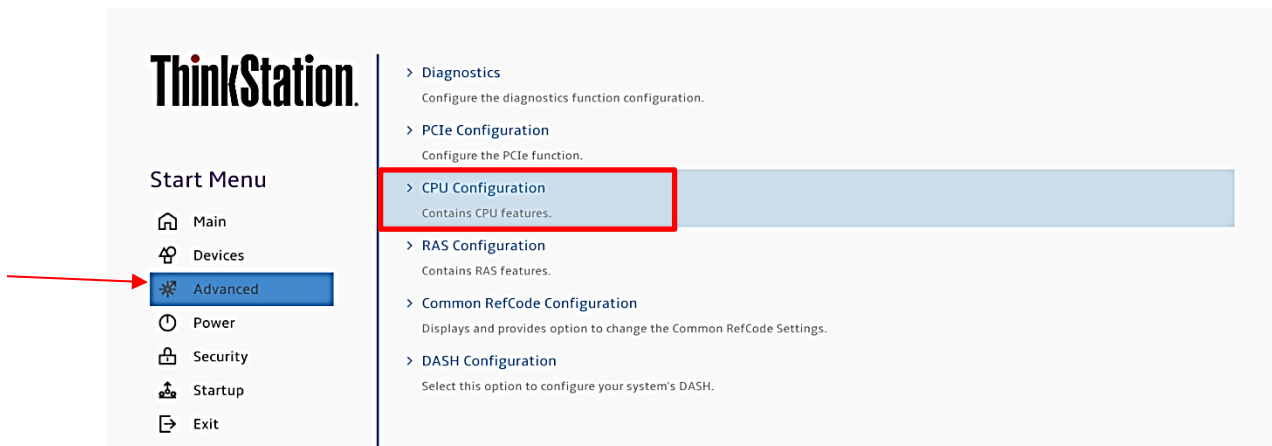


Figure 1 - Location of jumper JP55 on P620 board.

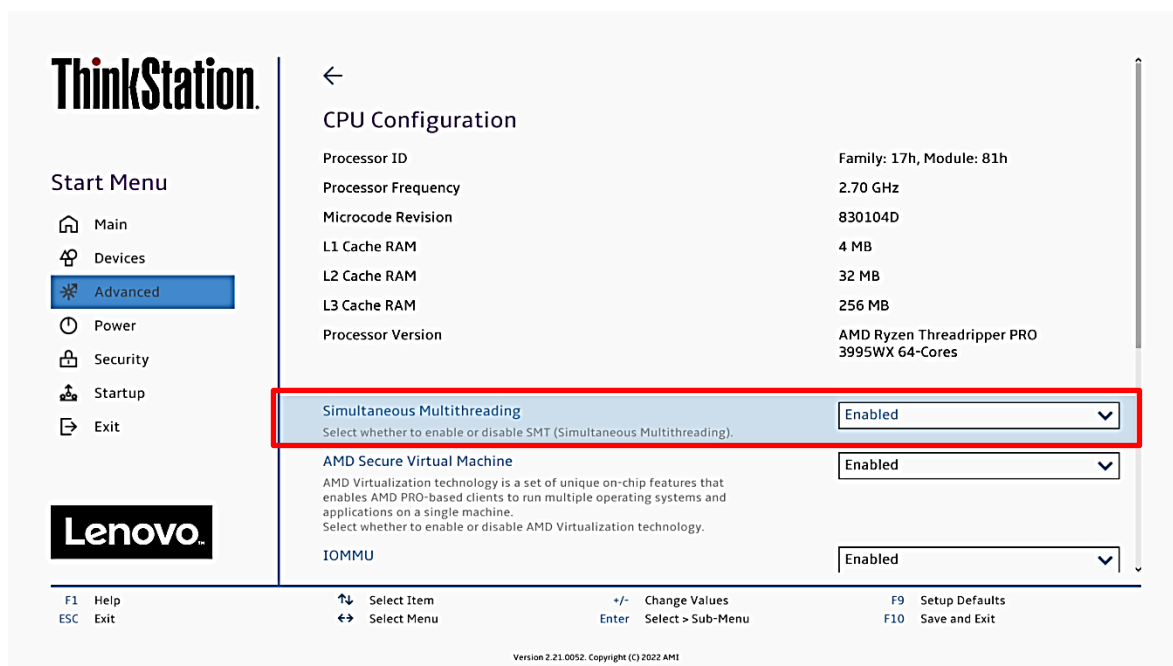
Special Instructions for Starting BIOS 0EA

If the starting BIOS version is BIOS S07KT0EA (BIOS 0EA) or earlier, it is critical to note to make sure BIOS Simultaneous Multithreading (SMT) is set to 'Enabled' prior to performing a BIOS update. Here are some quick step-by-step instructions to ensure BIOS is set correctly.

1. Boot into BIOS F1 setup.
2. Select the 'Advanced' menu option, then 'CPU Configuration'.



3. Select the drop-down menu for Simultaneous Multithreading and make sure this is set to 'Enabled'.



4. Select F10 to Save and Exit BIOS setup and follow the general BIOS Flash Update Procedure steps listed in the next section.

General BIOS Flash Update Procedure

Note: Select the BIOS update package that suits your need such as flash from Windows operating system, flash from EFI shell, or flash from ISO image.

1. Flash BIOS to S07KT26A. Refer to the readme file in the BIOS update package for specific instructions on each flash method.

EFI Shell:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07j326usa.zip

Flash from Windows OS:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07jy26usa.exe

Flash from ISO image:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07j926usa.iso

2. Reboot the system and verify BIOS revision level in BIOS setup.
See Figure 2.

3. Flash BIOS to S07KT45A. Refer to the readme file in the BIOS update package for specific instructions on each flash method.

EFI Shell:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07j345usa.zip

Flash from Windows OS:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07jy45usa.exe

Flash from ISO image:

https://download.lenovo.com/pccbbs/thinkcentre_bios/s07j945usa.iso

4. Reboot the system and verify BIOS revision level in BIOS setup.
See Figure 3.

Figure 2: BIOS revision level after successful BIOS update to version S07KT26A.

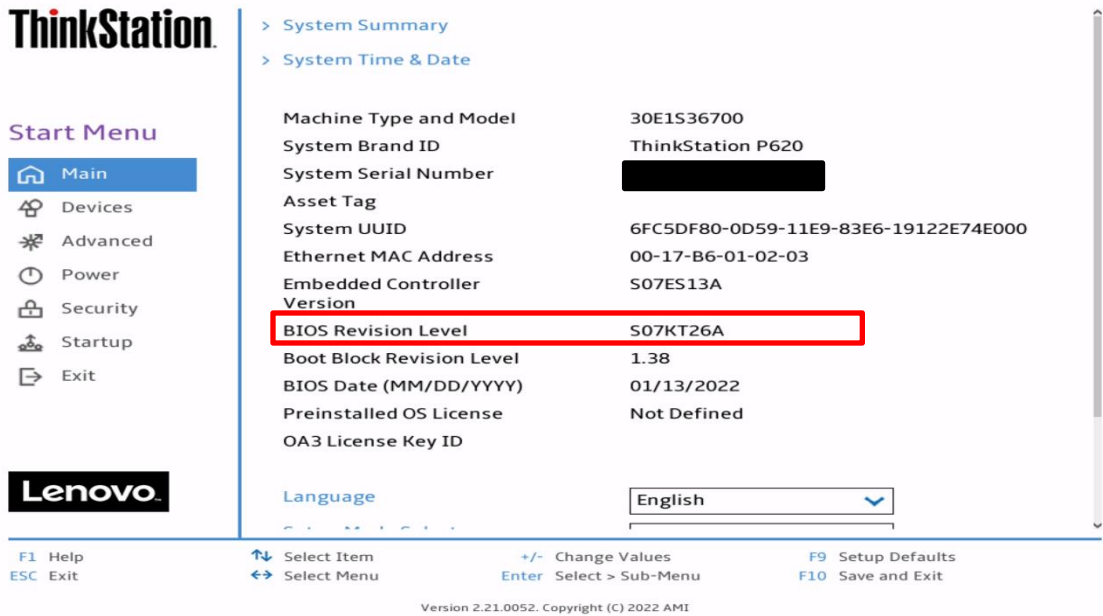
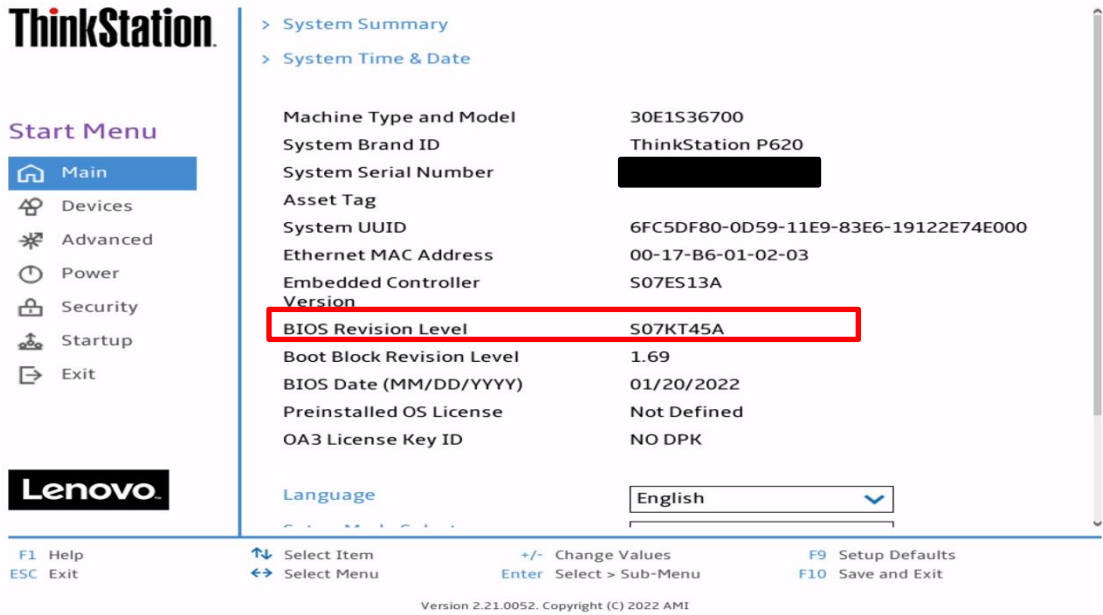


Figure 3: BIOS revision level after successful BIOS update to version S07KT45A.



Step 2 - CPU Removal and Installation

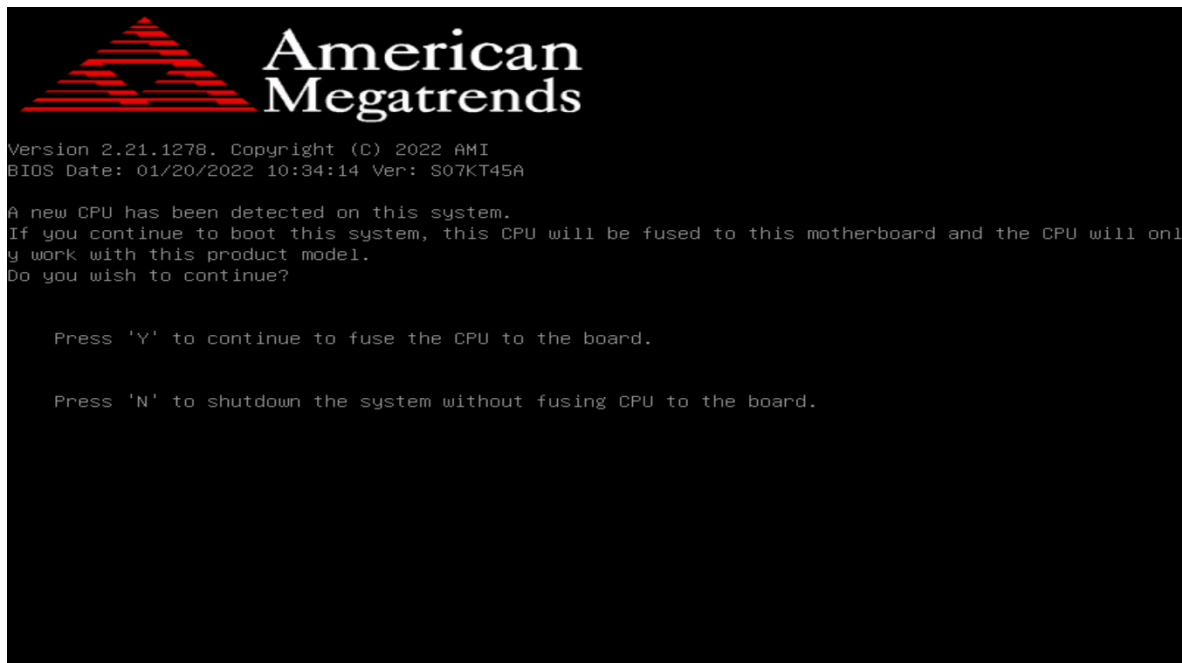
Please refer to the following document with step-by-step instructions on how to remove and install the new Chagall Workstation CPUs.

https://download.lenovo.com/pccbbs/thinkcentre_pdf/ts_p620_cpu_installation_removal_v1.0.pdf

Step 3 - CPU Fusing

The ThinkStation P620 platform supports AMD's Platform Secure Boot (PSB) technology, which provides robust security against remote hackers that could seek to embed malware into system firmware. As a result of supporting PSB, any Threadripper Pro CPU that is installed in the P620 platform will be bound via a one-time programmable fuse to Lenovo's signed BIOS code. From that point on, the fused processor will only function on motherboards using Lenovo's code signing key.

Figure 4: The following prompt will appear during POST on the first boot with a new processor.



Notes:

- Press 'Y' to continue to fuse the CPU to the board. This is non-reversible.
- Press 'N' to shutdown the system without fusing CPU to the board. This will not continue to boot and will instantly shutdown the system.

Revision History

Version	Date	Author	Changes/Updates
0.8	9/1/2022	Jason Moebs	Added special instructions for BIOS 0EA or earlier.
0.7	4/12/2022	Cory Chapman	Updated instructions for Step 1.
0.6	3/24/2022	Jason Moebs	Added details regarding JP55 jumper.
0.5	2/23/2022	Jason Moebs	Added mid-level BIOS update.
0.4	2/11/2022	Jason Moebs	Updates throughout. Added Step 3 about CPU fusing.
0.3	1/25/2022	Jason Moebs	Updates throughout.
0.2	1/18/2022	Jason Moebs	Updates throughout.
0.1	1/12/2022	Jason Moebs	Initial release