

Release Notes

Intel PROSet/Wireless Wi-Fi Software V22.220.0.4 PV Release

Wireless Solutions Group
WW14'23



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Release Overview

- Intel is announcing the 22.220.0.4 Production Version (PV) release of the Intel® PROSet/Wireless Wi-Fi Software.
 - This version is a PV version to support KBL, GLK, CNL, CFL, WHL, AML, CML, ICL, LKF, TGL, JSL, RKL, ADL, RPL platforms. This version is a maintenance release that addresses known issues reported in previous software versions.
 - This software package includes updates in the 22.220.0.4, 22.180.11.1, 21.80.30.1, 19.51.45.1 drivers.
 - Following the 'CCG Wireless EOL Plan' communication (document # 602054), starting with this release, both Windstorm Peak (Wireless-AC 8265) and Snowfield Peak (Wireless-AC 8260) drivers are no longer included.
 - This release contains certified drivers for Windows 10/11 – see details on next slide.

General Information

Driver Version		OS
TIC	PHWFW07521_22.220.0.4	
22.220.0.4	HrP1/2, JnP2, TyP2, GfP2, GfP4(Win11)	Win10 RS5, 20H1/2, 21H1/2, 22H2 Win11 October 2021, 22H2 Update (SV2)
22.180.11.1	JfP1/2, CcP2, HrP1/2, JnP2	
21.80.30.1	JfP1, JfP2, ThP2	
19.51.45.1	StP, SdP	Win10 20H1/2, 21H1/2 Win11 October 2021, 22H2 Update (SV2)

Supported Operating Systems

Windows 10 October 2018 Update (RS5)
NetWTw08/10 drivers only

Windows 10 May 2020 Update (20H1)

Windows 10 October 2020 Update (20H2)

Windows 10 May 2021 Update (21H1)

Windows 10 November 2021 Update (21H2)

Windows 10 Update (22H2)

Windows 11 October 2021 Update (aka Cobalt)

Windows 11 22H2 Update (aka Sun Valley 2)

1. GfP4 has limited functionality on win10 (No CDB).

Tested Platforms

Raptor Lake (RPL)

Alder Lake (ADL)

Tiger Lake(TGL)

Jasper Lake (JSL)

Rocket Lake (RKL)

Lakefield (LkF)

Kaby Lake (KbL) / Kaby Lake refresh (KbL-R)

Apollo Lake (ApL)

Sky Lake (SkL)

Broadwell (BDW)

Gemini Lake (GLK) / Gemini Lake Refresh (GLK-R)

Cannon Lake (CNL)

Coffee Lake (CFL)

Whiskey Lake (WHL)

Amber Lake (AML)

Ice Lake (ICL)

Comet Lake (CML)

Supported Hardware

Garfield Peak 4 (GfP4)/AX411

Garfield Peak 2 (GfP2)/AX211

Typhoon Peak 2 (TyP2)/AX210

Typhoon Peak 2 embedded (TyP2)/AX210-embedded

Typhoon Peak 2 industrial (TyP2)/AX210-industrial

Harrison Peak1 (HrP1)/AX101

Harrison Peak2 (HrP2)/AX201

Johnson Peak2 (JnP2)/AX203

Cyclone Peak 2 (CcP2)/AX200

Thunder Peak2 (ThP2)/9260

Jefferson Peak2 (JfP2)/9560

Jefferson Peak1 (JfP1)/9461/9462

Sandy Peak (SdP)/3168

Maple Peak (MpL)/17265 (WiGig)

Stone Peak 2 D0 (StP2)/7265

Stone Peak 1 (StP1)/3165

22.220 Production Version Release – Wi-Fi Package Layout

- The **Green** areas indicate the new SW in this release (22.220.0.4).

CNVi	Module	Win10/11
Solar	GfP4 AX411	22.220.0.4 ¹ NETwaw12.sys(NetAdapter) (22.220.0.4)
Solar	GfP2 AX211	22.220.0.4 ¹ NETwtw12.sys (22.220.0.4)
Solar	HrP1 AX101; HrP2 AX201; JnP2 AX203	
N/A	TyP2 AX210	
N/A	CcP2 AX200	22.220.0.4 ¹ NETwtw10.sys (22.180.11.1)
Quasar	HrP1 AX101; HrP2 AX201; JnP2 AX203	
Solar / Quasar	JfP1 9461/9462; JfP2 9560;	
Pulsar	JfP1 9461/9462; JfP2 9560;	22.220.0.4 ¹ NETwtw08.sys (21.80.30.1)
N/A	ThP2 9260	
N/A	SdP 3168	19.51.45.1 NETwtw04.sys
N/A	StP1 3165	
N/A	StP2-D7265	

¹. **Please note:** Since these drivers use the same INF, Device Manager will show the same driver version. The version in brackets shows the File version for that specific driver (.sys file) in the 'Driver File Details' tab.

Corrected Customer Issues since 22.200.0.6

22.220.0.4(NETwtw12.sys/NETwaw12.sys) driver only

Key	Headline (as reported)	Reported HW	Description	Issue type
WIFI-274412	TX throughput was degraded against Samsung S21 when changing the role from GO to p2p client.	GfP2	During P2P connection, packet padding wasn't configured correctly, which caused packet loss	Performance
WIFI-272933	[FW Assert 0x20003220] WLAN Yellow bang issue	GfP2 Solar	Fix TWT sleep period scheduler	Yellow Bang
WIFI-272412	ANT tool shows error with 9462 on ADL	JfP1 Pulsar /Quasar	Antenna identification bit was removed on Solar family , which cause ANT tool wrong measurements	OEM Tool
WIFI-270141	We can only connect UNII-4 band with MCC = FR while we enable UNII4 for US in BIOS	GfP2 Solar	LAR MCC fix related to UNII-4	Regulatory
WIFI-267888	TAS State shows "Invalid"	GfP2 Solar	Missing implementation in Ant tool and windows driver for recent changes in TAS FW statistics collection and report. This caused TAS status to be shown as "Invalid"	OEM Tool
WIFI-252051	TAS enable some question for AX411	GfP4 Solar	Missing implementation in Ant Tool and windows driver for recent changes in TAS FW statistics collection and report. This caused TAS status to be shown as "Invalid"	OEM Tool
WIFI-266055	WiFi throughput drop when BT is enabled but not connected to BT device	HrP1	Fix HrP1 BT Coex AGC table (antenna gain controller)	Performance
WIFI-252454	uCode error (EventID 5002) after roam.	HrP2	Issue occurred when AP downgrades the supported bandwidth in the association response comparing to the bandwidth in advertised beacon. In the fix, the driver changes the FW TLC (Transmit Layer control) configuration order, to update the Phy before the TLC.	Roaming

Corrected Customer Issues since 22.200.0.6

22.220.0.4(NETwtw12.sys/NETwaw12.sys) driver only

Key	Headline (as reported)	Reported HW	Description	Issue type
WIFI-286646	No GO negotiation confirm and P2P establish fail between PC and Phone	GfP2	Fix race between FW GO update and GO negotiation response from Samsung device	Functionality
WIFI-284407	System longer boot(circling) time after install WLAN 22.170.2.1(With DMAr Eanble)	TyP2	Driver RFD (Receive Frame Descriptor) queues memory allocation improvements	Performance
WIFI-288192, WIFI-283451	loop of alive resets causing YB due to OTP unexpected value	GfP2	Security mitigation (for CVE-2022-27635) might generate a Wi-Fi Yellow-Bang (YB) after upgrading to the Wi-Fi 22.200 driver on Windows.	Yellow Bang
WIFI-283154	BSOD occurs during communication test of mobile hotspot - DPC_WATCHDOG_VIOLATION (133) - Netwtw10!osalSyncAcquireSpinLock+0x16	GfP2	Fix locking issue in Management frame handling function	BSOD
WIFI-283151	Killer1690i DBS test fail in OTA Assert 0x103C	GfP4	Triggering full Data Path reset in case of invalid TX command during aggregation flow	Assert
WIFI-278150	DDD log can't decode	GfP4	Fix the DDD player data decode handling	Debug logger
WIFI-273614	auth_req sends inappropriate data rates	HrP2	For BSS connection , make sure that supported rates and BSS Membership selectors element will be set per 802.11 specification	Functionality

Corrected Customer Issues since 22.180.3.1

22.180.11.1(NETwtw10.sys) driver only

Key	Headline (as reported)	Reported HW	Description	Issue type
WIFI-283806	[USC][TGL] OEM Tool cannot connect with USC which in PV packet	HrP2	loading incorrect USC dll when installing the driver on QsR family HW's	USC (Tools)
WIFI-278898	[22.190DDD] Cannot install v22.190.0.0.4 DDD driver	HrP2	Missing HW's in DDD INF for specific HW	Debug installer
WIFI-274412	TX throughput was degraded against Samsung S21 when changing the role from GO to p2p client.	Quasar family	During P2P connection, packet padding wasn't configured correctly, which caused packet loss	Performance
WIFI-274368	Unable to connect to ixVeriwave on 5GHz	HrP2	Choosing incorrect rate for sending management frames.	Functionality
WIFI-272412	ANT tool shows error with 9462 on ADL	JfP1 Pulsar /Quasar	Antenna identification bit was removed on Solar family , which cause ANT tool wrong measurements	OEM Tool
WIFI-266055	WiFi throughput drop when BT is enabled but not connected to BT device	HrP1	Fix HrP1 BT Coex AGC table (antenna gain controller)	Performance
WIFI-283806	OEM Tool cannot connect with USC which in PV packet	HrP2 Quasar	Loading incorrect dll version in Quasar family INF (relevant for Net08)	OEM Tool

Corrected Customer Issues since 19.51.42.1

19.51.45.1 (NETwtw04.sys) driver only

Key	Headline (as reported)	Reported HW	Description	Issue type
WIFI-264725	Driver hang and scan list show empty after resume from S3 or frequent radio off/on in ID and RU, no repro in China	Stone Peak 1 (3165)	Complete FW load in case of failure detecting MCC	Functionality

DCRs and New Features – 22.220 PV

DCR #	Description	Improvements	Relevant HWs
DCR-1993	EOL of Snowfield Peak and WindStorm Peak		
DCR-1833	[OEM Tools - ANT] Align TAS Data present in ANT	<ol style="list-style-type: none"> 1. TAS version 2. TAS status: Running/Disable 3. SAR limit 4. Max Regulatory Power Limit 5. Near Disconnection indication 6. Black List 7. TAS header (32bit) 8. OEM Name 9. Country Code 10. Frequency 	
DCR-2057	Enable 6E for new countries	Enable 6E countries: Antigua and Barbuda, Aruba, Bahamas, Barbados, Colombia, Bermuda, Dominican Republic, Jamaica, Niger, Qatar, Tajikistan, Kuwait, Madagascar and Ghana	GfP2, GfP4, TyP2
DCR-1869	New API - Check the UNII-4 readiness of Intel Wi-Fi Module on customer platform	Added PIE API to check if platform is UNII-4 enabled	CcP2, GfP2, GfP4, HrP1, HrP2, TyP2
DCR-1826	TyP2/GfP2 Fix 5.8GHz UK Profile to SRD	Set UK GP on TyP/GfP 5.8GHz back to SRD to be consistent with UKCA certificate	GfP2, GfP4, TyP2

DCRs and New Features – 22.220 PV

DCR #	Description	Improvements	Relevant HWs
DCR-2149	Enable/Disable Wi-Fi Sensing on Lid State and Power Supply conditions	Wi-Fi Proximity Activation Deactivation on Lid and Power Source State Change	GfP2
DCR-2117	Add notch filter to mitigate 5250MHz platform noise	Customer platform has a spur noise on 5250MHz. Intel to provide a FW configuration that mitigates this noise.	GfP2/4, TyP2
DCR-2060	Driver INF country name change "Turkey" to "Türkiye"	Based on latest UN decision country name change from "Turkey" to "Türkiye".	CcP2, GfP2/4, HrP1/2, TyP2
DCR-1887	[WoWLAN] Blocking D3 Wake due to BSS Transition Management Request frame Reception	Avoid D3 wake as a results of BSS transition management request frame	GfP2/4, TyP2
DCR-1807	China New regulation update 2/2 --> CB Geo Profile regulatory change to support new China spec		JfP1, JfP2, ThP2, CcP2, GfP2/4, HrP1/2, TyP2
DCR-1451	Avoid Missed beacon by increasing sensitivity calibration thresholds	avoid missed beacon in a crowdy environment by increasing the sensitivity calibration thresholds	CcP2, GfP2/4, HrP1/2, TyP2

Extension INF/ Component INF

INF	Version	Summary	HW
PieComponent.inf	22.1220.0.2	Date and time change	GfP2/4,TyP2,HrP1/2,JnP2,CcP2,JfP1/2,ThP2, SdP,StP
PieExtension.inf	22.1210.0.2	copyright text	GfP2/4,TyP2,HrP1/2,JnP2,CcP2,JfP1/2,ThP2, SdP,StP

Software Known Issues and Limitations – 22.220

Key related	Description	OS and HWs	Notes

Product Health

Domain	22.220.0.4	Details
Connectivity		
Platform		
Data Path \ TpT		
Miracast		
SoftAP		
BT-Coex		
Wi-Fi Device Power		
Cert (WHQL)		

Legend:

	Broken, Not usable
	Usable, major issues exist
	Usable

<Color Guidelines>

Critical bug(s) or critical usability issues

minimum 1 High P1. if >=5 High P1 – mandatory. Also If > 20 High - mandatory

Notes on the DDD Debug Layout Usage

- Included with the user distributed layouts is also a DDD debug layout. This layout incorporates debug capabilities to be used by OEM validation teams to provide logs and information about an issue to Intel engineering.
- This layout is not to be included on production systems or to be shared with end-user customers.
- To use the DDD layout, follow the instructions below:
 - 1) Clean the Windows event log by the following commands with administrator prompt.

```
wevtutilcl system
wevtutilcl application
wevtutilcl Microsoft-Windows-WLAN-AutoConfig/Operational
```
 - 2) Install DDD release.
 - 3) Perform test until issue reproduction.
 - 4) Note down the exact time when issue reproduced.
 - 5) Disable WiFidevice in the device manager.
 - 6) Copy all files below to share with Intel:
 - I. "System.evtx" under C:\Windows\System32\winevt\Logs
 - II. "Application.evtx" under C:\Windows\System32\winevt\Logs
 - III. "Microsoft-Windows-WLAN-AutoConfig%4Operational.evtx" under C:\Windows\System32\winevt\Logs
 - IV. "dddLog_XXX.bin" for ThP/JfP/CcP/HrP is under C:\Windows\Temp\DDDLogs\ (for RS3/RS4) and under C:\Windows\System32\Drivers\DriverData\Intel\Wlan\Out\DDD (for RS5 or later). For legacy devices "dddLog_XXX.bin" is under C:\Windows\Temp\DDDLogs\ (for RS5 or later)
 - V. "MurocLog.log" under C:\Program Files\Intel\WiFi\UnifiedLogging\
 - VI. "MEMORY.DMP" under C:\Windows\System32

Abbreviations

Acronym	Codename	Intel product name
JnP2	Johnson Peak 2	Intel® Wi-Fi 6 AX203
GfP4	Garfield Peak 4	Intel® Wi-Fi 6E AX411
GfP2	Garfield Peak 2	Intel® Wi-Fi 6E AX211
TyP2	Typhoon Peak 2	Intel® Wi-Fi 6E AX210
CcP2	Cyclone Peak 2	Intel® Wi-Fi 6 AX200
HrP1	Harrison Peak 1	Intel® Wi-Fi 6 AX101
HrP2	Harrison Peak 2	Intel® Wi-Fi 6 AX201
JfP1- DA	Jefferson Peak 1 Diversity antenna	Intel® Wireless-AC 9462
JfP1- SA	Jefferson Peak 1 Single antenna	Intel® Wireless-AC 9461
JfP2	Jefferson Peak 2	Intel® Wireless-AC 9560
ThP2	Thunder Peak 2	Intel® Wireless-AC 9260
WsP	Windstorm peak	Intel(R) Dual Band Wireless-AC 8265
SdP	Sandy Peak	Intel(R) Dual Band Wireless-AC 3168
StP2	Stone Peak 2	Intel(R) Dual Band Wireless-AC 7265
StP1	Stone Peak 1	Intel(R) Dual Band Wireless-AC 3165
SfP	Snowfield Peak	Intel(R) Dual Band Wireless-AC 8260
WkP2	Wilkins Peak 2	Intel(R) Dual Band Wireless-AC 7260
WkP1	Wilkins Peak 1	Intel(R) Dual Band Wireless-AC 3160

Glossary

- COEX = Coexistence. This refers to when Bluetooth and Wi-Fi are both operating simultaneously in the 2.4Ghz band. Collisions between the radios can occur and degrade performance.
- PC = Production Candidate – Part of the initial software series on a new adapter (e.g. alpha, beta, PC, PV)
- PV = Production Version – Software that is approved for shipping
- SP = Service Pack – an intermediate release between major release. It usually only has defect corrections.
- MR = Major Release – Includes new features and defect corrections.
- WA = Workaround
- RN = Release Note
- HF = Hot Fix – a software release with minimal change. Created to resolve a urgent customer need.
- YB – Yellow exclamation mark in device manager. Indicates that a driver is not functioning properly
- POA – Platform, OS, Adapter e.g. (Kaby lake, RS1, WsP) – usually refers to OS/Adapter combo.
- ATS – ACL Time Share

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