# cPacket cVu® AG/EAG
# Network Packet Broker Observability Nodes

## Cost-Effective Aggregation, Network Packet Brokering, and Microburst Monitoring

**cVu AG/AGE series observability nodes enable you to:**

- **Cost-effectively provision network visibility with a scalable 3-in-1 solution option: aggregation, brokering, and monitoring**

- **Maximize the observability of your IT network infrastructure and application workloads by combining streaming network packet data and real-time analytics**

- **Know what is happening with lossless packet acquisition and high-resolution timestamping, performance KPIs, microburst profiling**

- **Strengthen the security posture by feeding network traffic to SOC and security analysts, analytics, and tools such as NDR**

- **Seamlessly expand visibility to hybrid-cloud and multi-cloud infrastructure using the physical and virtual nodes**

- **Gain IT operational efficiency to minimize outages and service disruptions with reliable real-time visibility into physical networks operating at up to 400 Gbps**

- **Centrally manageable through cPacket cClear® observability layer and integrated with cStor® packet capture & analysis observability nodes**

## Network Data Consolidation and Brokering for Observability

The number of TAP and SPAN points in a large network can generate a lot of network data to feed to the security and performance monitoring tools for observability and instrumentation. Moreover, the tool rail itself needs to scale and expand over time. Therefore, there is a need for consolidating and delivering the network data for both aggregations uses.

cPacket cVu AG/EAG series network packet broker (NPB) observability nodes are purpose-built for high-performance 400Gbps and below aggregation. This includes cVu 32100AG and cVu 32100EAG series nodes offering 32 ports of wire-speed 100Gbps that can also operate in 40/25/10Gbps and cVu 32400AG and 32400EAG series nodes offering 32 ports of wire-speed 400Gbps that can also operate in 100/40/25/10Gbps mixed mode to aggregate tools and TAPs at different network speeds providing great flexibility and investment protection. Rich network packet data from the nodes combined with real-time analytics, give IT network and security operations teams vital observability through network visibility and actionable intelligence. The cVu nodes are deployed out-of-band, so they do not interfere with the network forwarding plane.

Making IT infrastructure and application workloads observable and secure requires acquiring and analyzing network data. Packet brokering along with the network TAPs is necessary to acquire, process, and deliver the network packet data for analysis and inspection maximizing observability and operational efficiency.

The cVu AG/EAG observability nodes offer cost-effective versatility plus packet processing features not typically implemented in other packet brokers in this class. Additionally, a full set of advanced real-time packet processing features are available with the cVu NG/NGE series packet brokering and monitoring observability nodes (see NG/NGE series datasheet). A two-tier scalable architecture is recommended for futureproofing where cVu AG/EAG and cVu NG/NGE nodes are deployed together.

The cVu AG/EAG series nodes aggregate the cTap® series TAPs and tools with basic data manipulation (such as filtering, and decapsulation), while the cVu NG/NGE nodes provide advanced packet processing and manipulation services such as deduplication and microburst-monitoring). At the same time, cPacket also provides the cVu-V® series packet brokering virtual nodes for virtualized east-west traffic and cloud deployments.

The net result is complete 360-degree network visibility and overall observability. The cVu nodes can also feed a copy of the selected network data to cPacket cStor® and cStor-V® series packet capture and analysis observability nodes for storing and analyzing the data for the long term. This may be required for latency or TCP analysis, multi-hop service troubleshooting, security forensics for incident response, or compliance reasons. Refer to the cStor data sheet for more details. All cPacket observability nodes including cVu series are provisioned, managed, and observed using cPacket cClear® observability platform, although they also have their own user interfaces (UI) for quick access.

### Scalable Two-Tier Overlay Architecture

Your network is neither static nor homogenous, so cPacket offers multiple types of observability nodes to meet current and evolving needs. The cVu series product line includes the AG/EAG (cVu 32100AG, 32100EAG, 32400AG, and 32400EAG), and NG/NGE (cVu 16100NG, 8100NG, 4100NG, 3240NG, 2440NG, 560NGE, 400NGE-CX, and 400NGE) nodes. Although in smaller networks, a single packet brokering layer may suffice, in any larger network, a more scalable two-tier architecture is recommended for future expansion without rewiring the network.

You can deploy cVu nodes in single and multi-tier topologies by combining AG/EAG models with NG/NGE models. The EAG models include some extra functionality listed below. These features are beneficial when using a two-tier architecture to capture packet arrival time at an ingress port and microburst information directly from a network port versus after passing through a node and hence being influenced by an additional hop.

- Ingress timestamping (both cPacket format and MAC Replacement format)
- Microburst profiling using cPacket cBurst® feature

### High-Performance Distributed Architecture

The cVu AG/EAG series observability nodes are a key component of the cPacket hybrid-cloud observability stack that delivers the industry's best packet brokering performance, features, port density, and scalability for physical and hybridcloud IT environments. Purpose-built hardware ensures that all packet processing features on all ports work flawlessly and simultaneously without dropping packets when used as specified. The cVu AG/EAG nodes provide concurrent multi-port network traffic acquisition, aggregation, filtering, load balancing, and forwarding. This internal distributed architecture design assures that you gain the scale and performance details needed in real-time to understand what is happening on every link in your network by providing the following functionality:

- Lossless packet acquisition, aggregation, and delivery
- High resolution timestamping (EAG model only)
- Basic packet filtering
- Microburst profiling using cPacket cBurst feature (EAG model only)
- Adjusting data rates to bridge between sources and destinations that transmit and receive at different data rates (bridging is typically from faster to slower data rates)
- Packet replication and forwarding/delivery (data pipelining) to multiple targets

### High-Performance Lossless Network Data with Real-Time Monitoring

The cVu AG/EAG nodes are non-blocking when used as specified to losslessly acquire packets at varied wire data rates up to 400Gbps using TAP/SPAN/ERSPAN ports, and VXLAN tunnels. Losslessly acquiring network data is vital for security applications using NDR/XDR and SEIM tools because every packet is essential, and dropped packets are an exploitable vulnerability. Refer to specifications to see all supported features.

Observability, visibility, and customizable network data are losslessly acquired and derived from custom vantage points in physical and hybrid-cloud IT environments and reliably and simultaneously delivered to multiple targets such as:

- Security and IT operations analysts and security tools they use
- Packet capture and analytics nodes such as cPacket cStor and cStor-V nodes
- Network TCP Analytics such as the cClear and cClear-V physical and virtual observability nodes that include interactive data visualizations compiled into customizable dashboards

### High-Fidelity Observability of Your IT Network

All cVu AG/EAG nodes facilitate pipelining of network packets from multiple sources to multiple targets. They also provide unbiased traffic details that help pinpoint, troubleshoot, and resolve IT problems, minimize outages, and help strengthen IT infrastructure resilience to cyberattacks when used with security analytics and tools such as Network/Extended Detection and Response solutions (NDR, XDR). Details captured by monitoring traffic include protocol and traffic KPIs. Results are available by API and are presented via customizable alerts and interactive visualizations compiled into customizable dashboards using the cClear observability platform. Key performance indicators identify "top talkers," traffic spikes and microbursts, over-subscription, and data loss at the network packet level (i.e., dropped, and lost network packets).

The cVu EAG nodes use accurate PTP/PPS time information to help measure KPIs such as one-way and roundtrip latencies. The network packet data and KPIs provide network-perspective visibility necessary to know what is happening with your IT infrastructure, including the network and application workloads.

Microbursts often foretell capacity shortcomings and other problems. The cVu EAG nodes include the industry's most unique microburst detection and profiling feature, called cBurst, which provides precise details. Data and visualizations reveal the total burst load over time so that sensitive environments such as financial trading exchanges can accurately plan and optimize network capacity to handle steady-state traffic and traffic bursts.

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The combination of network packet data, KPIs, analytics results, intuitive visualizations, and actionable alerts provides observability from the network perspective to always know what to do to ensure the availability, responsiveness, and security of your IT network, infrastructure, and application workloads.

### Specialized Features for Financial Services, HFT/HPC, Government, Healthcare, etc.

The cVu observability nodes are designed to meet specific procurement and use case requirements of financial enterprises, and high-frequency trading. high-performance computing, government, and education organizations. All models are engineered and manufactured for TAA compliance and select models and have FIPS 140 Level-2 cryptography. Protocol analytics supports industry and application-specific use cases such as profiling microbursts and market-feed data gaps (i.e., the cMDF Market Data Feed Analytics feature).

Enterprises in all industries rely on their networks to connect data centers, compute and storage farms, information sources, customers, suppliers, and other stakeholders. The proven reliability, flexibility, and high-fidelity capabilities are leveraged by many organizations, including financial services, healthcare, retail, manufacturing, Internet Service Providers, managed-services providers, telecommunications, and others.

### Hybrid-Cloud IT Infrastructure

You can seamlessly extend the network visibility to span physical plus multi-cloud environments using the cPacket observability nodes. A single instance of cClear (or cClear-V) observability platform manages the full hybrid-cloud deployment, with customizable off-the-shelf dashboards that show traffic, analytics results, and other network-centric KPIs.

The cPacket hybrid-cloud observability is a full-stack solution. It includes the following components that maximize the observability of your IT network with network packet pipelining, analytics, actionable alerts, and visualizations:

- cVu packet broker and monitoring observability nodes – provide network data consolidation, packet processing, pipelining with lossless acquisition and KPIs for certain real-time monitoring.
- cStor packet capture and analysis observability nodes – provide lossless packet capture with on-board/off-board storage and historic KPIs; all of which can be accessed by queries, streaming, and as exported PCAP files.
- cClear observability platform – provides analytics, additional KPIs, alerts, and interactive visualizations via customizable dashboards. It also hosts the user interface for managing the observability nodes.

## Deployment

The cVu AG/EAG observability nodes are available in industry-standard 1RU chassis, rack-installable and designed to readily fit into any data center, campus, remote site, or telco environment and offer configurable mix-and-match port data rates ranging from 10Gbps to 400Gbps. Industry-standard transceivers (QSFP-DD, QSFP28, QSFP+, SFP28, and SFP+) are used for full interoperability and compatibility with other vendors' monitoring fabric, averting vendor lock-in.
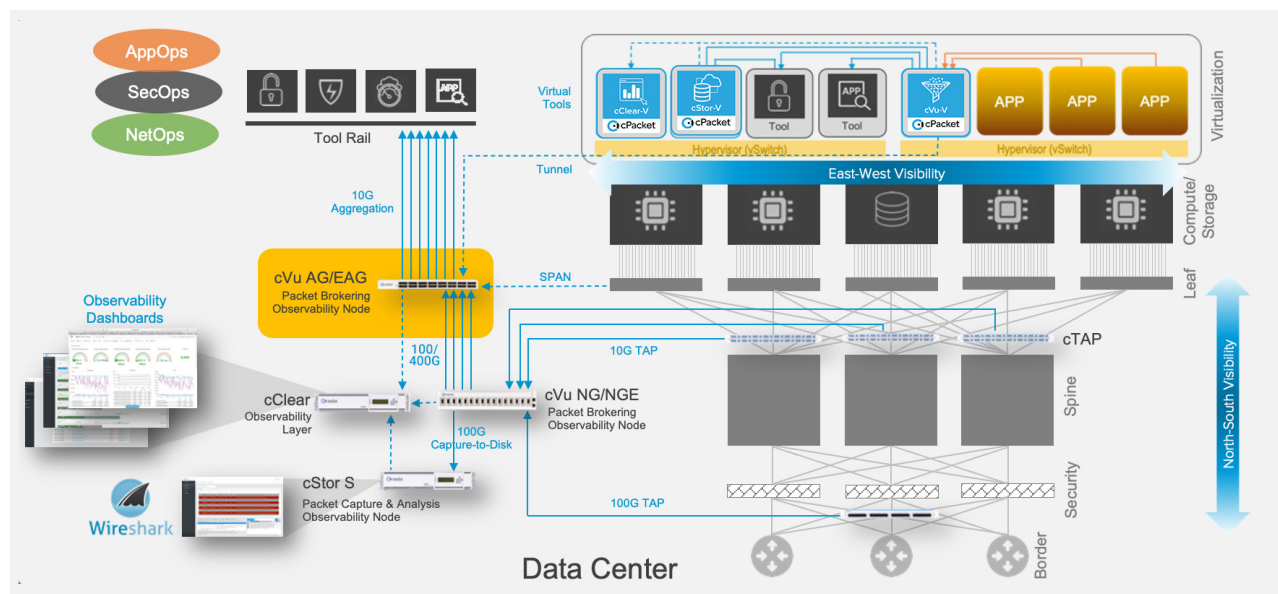


Figure 1: Reference Design for Complete Observability of North-South and East-West Network Traffic

Typical deployment in an on-premises network such as a data center for north-south traffic visibility in an out-of-band fashion. The cTAP series TAPs passively acquire and feed data from strategic vantage points to a cVu node. Network packets are timestamped, inspected, filtered, replicated, and intelligently forwarded to specific targets upon ingress (features vary by model, refer to the specifications).

For high-density deployments, cVu AG/EAG nodes should be used to acquire and aggregate network packet data from many ports. Using both cVu AG/EAG and cVu NG/NGE nodes is ideal for optimizing cost-per-port and separate receiver targets that ingest data at rates slower than the core network. You can achieve such goals by implementing a two-tier architecture to cost-effectively scale by aggregating traffic using AG/EAG nodes in the first tier and performing advanced real-time processing and packet streaming delivery using NG/NGE nodes in the second tier, as shown in Figure 2.
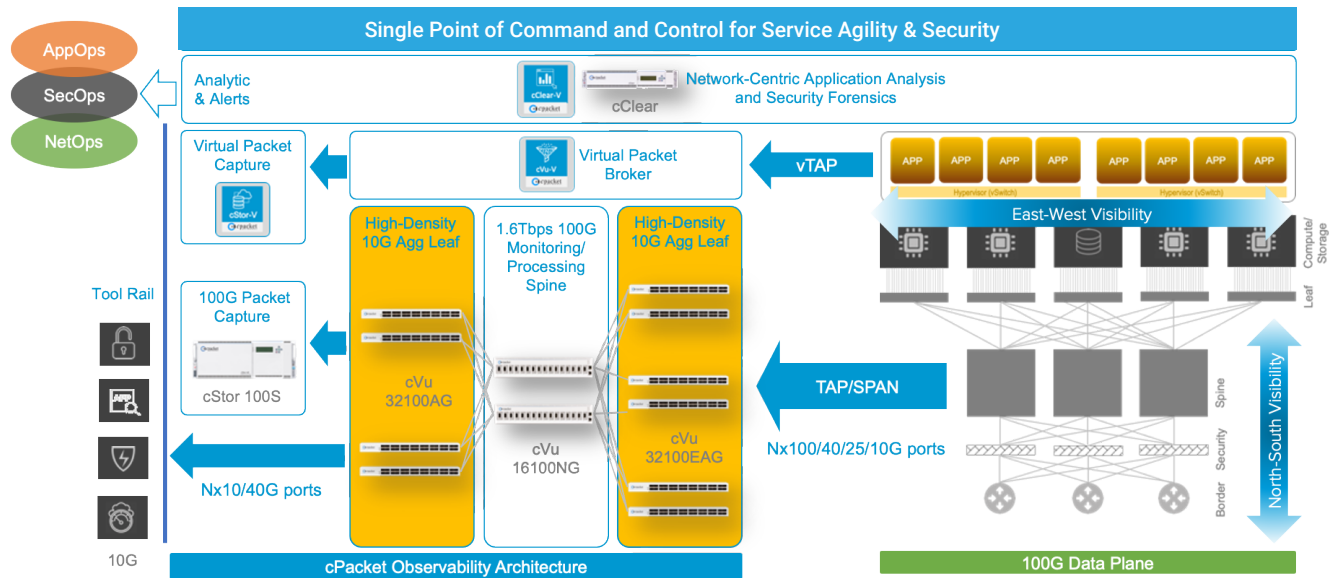


*Figure 2: Reference Design for a 2-Tier Scalable Observability Architecture*

All cPacket physical and virtual nodes seamlessly interoperate to seamlessly scale across distributed hybrid-cloud environments. IT operations and security teams gain holistic single-pane-of-glass observability into any IT network and the infrastructure it supports. Other components consume the high-resolution analytics results and KPIs specifically the cStor® and cClear® physical and virtualized nodes. The analytics results and KPIs are also available to other devices, dashboards, and software via a RESTful API for further analysis, visualization, and incorporation into other IT tools.

## cVu AG/EAG Technical Specifications

### Key Features

| | cVu 32100AG | cVu 32100EAG | cVu 32400AG | cVu 32400EAG |
|---|---|---|---|---|
| Traffic Aggregation/Replication | Yes | Yes | Yes | Yes |
| Load Balancing | Yes | Yes | Yes | Yes |
| VXLAN Termination | Yes | Yes | Yes | Yes |
| L2/L3 Protocol Stripping (VLAN/MPLS) | Yes | Yes | Yes | Yes |
| VLAN Tagging | Yes | Yes | Yes | Yes |
| Filtering | Yes | Yes | Yes | Yes |
| High-Resolution Counters (HRC KPI) | Yes | Yes | Yes | Yes |
| Microburst Analysis (cBurst) | No | Yes | No | Yes |
| cPacket Timestamping | No | No | No | No |
| MAC Replacement Timestamping | No | Yes | No | Yes |
| Time Sync Management (PTP/NTP) | Yes | Yes | Yes | Yes |
| Role-Based Administration | Yes | Yes | Yes | Yes |
| Software Upgrade/Restore | Yes | Yes | Yes | Yes |
| GUI, Serial Console and CLI | Yes | Yes | Yes | Yes |
| SNMPv2c and MIB | Yes | Yes | Yes | Yes |
| Optical Transceiver Diagnostics | Yes | Yes | Yes | Yes |
| TACACS+/RADIUS Authentication | Yes | Yes | Yes | Yes |
| Unified Management (requires cClear) | Yes | Yes | Yes | Yes |
| Certified FIPS 140 Level 2 Cryptography | No | No | No | No |
| TAA Compliance | Yes | Yes | Yes | Yes |

### Interface and Connectivity

| | cVu 32100AG | cVu 32100EAG | cVu 32400AG | cVu 32400EAG |
|---|---|---|---|---|
| 1 GbE Ports (SFP) | (128*) | (128*) | (128*) | (128*) |
| 10 GbE Ports (SFP+) | 128* | 128* | 128* | 128* |
| 25 GbE Ports (SFP28) | 128* | 128* | 128* | 128* |
| 40 GbE Ports (QSFP+) | 32 | 32 | 32 | 32 |
| 100 GbE Ports (QSFP28) | 32 | 32 | 128* | 128* |
| 400 GbE Ports (QSFP-DD) | N/A | N/A | 32 | 32 |
| Max Monitoring Rate | 100 Gbps | 100 Gbps | 400 Gbps | 400 Gbps |
| Management Interface | Ethernet/Serial (RJ45) | Ethernet/Serial (RJ45) | Ethernet/Serial (RJ45) | Ethernet/Serial (RJ45) |
| Timing/Synchronization | PTP/NTP | PTP/NTP | PTP/NTP | PTP/NTP |

*Using QSFP+/QSFP28 breakout box/cables, ( ) Using 10G ports

### Dimensions and Weight

| | cVu 32100AG | cVu 32100EAG | cVu 32400AG | cVu 32400EAG |
|---|---|---|---|---|
| Height/Rack Unit | 1.72" (4.4) | 1.72" (4.4) | 1.72" (4.4) | 1.72" (4.4) |
| Width | 16.84" (42.8) | 16.84" (42.8) | 16.84" (42.8) | 16.84" (42.8) |
| Depth | 22.0" (55.9) | 22.0" (55.9) | 22.0" (55.9) | 22.0" (55.9) |
| Weight | 24.5 lb (11.1 kg) | 24.5 lb (11.1 kg) | 25.4 lb (11.52 kg) | 25.4 lb (11.52 kg) |

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## cVu AG/EAG Technical Specifications

### Operating Conditions

|  | cVu 32100AG | cVu 32100EAG | cVu 32400AG | cVu 32400EAG |
|---|---|---|---|---|
| Operating Temperature | 32° F − 104° F<br>0° C − 40° C | 32° F − 104° F<br>0° C − 40° C | 32° F − 104° F<br>0° C − 40° C | 32° F − 104° F<br>0° C − 40° C |
| Operating Humidity | 5% − 85% | 5% − 85% | 5% − 85% | 5% − 85% |
| Certifications | FCC Class A<br>FCC Class CE | FCC Class A<br>FCC Class CE | FCC Class A<br>FCC Class CE | FCC Class A<br>FCC Class CE |

### Power and Cooling

|  | cVu 32100AG | cVu 32100EAG | cVu 32400AG | cVu 32400EAG |
|---|---|---|---|---|
| Airflow | Front-to-Back | Front-to-Back | Front-to-Back | Front-to-Back |
| Power Redundancy | 1+1 AC/DC<br>100-264 VAC<br>50-60 Hz | 1+1 AC/DC<br>100-264 VAC<br>50-60 Hz | 1+1 AC/DC<br>100-264 VAC<br>50-60 Hz | 1+1 AC/DC<br>100-264 VAC<br>50-60 Hz |
| Heat Dissipation | 250 W | 250 W | 250 W | 250 W |

## Ordering Information

### Product SKU

| | |
|---|---|
| CP_CVU_32100AG | cPacket cVu 32100AG aggregation and distribution network packet broker and monitoring observability node, 3.2Tbps forwarding capacity with 32x100GbE QSFP28 ports in 1RU.Redundant AC power supplies. Maintenance not included. |
| CP_CVU_32100EAG | cPacket cVu 32100EAG aggregation and distribution network packet broker and monitoring observability node, 3.2Tbps forwarding capacity with 32x100GbE QSFP28 ports in 1RU Redundant AC power supplies. Low-latency monitoring with microburst analysis (cPacket cBurst) and PTP based timestamping. Maintenance not included. |
| CP_CVU_32400AG | cPacket cVu 32400AG aggregation and distribution network packet broker and monitoring observability node, 12.8Tbps forwarding capacity with 32x400GbE QSFP-DD ports in 1RU. Redundant AC power supplies. Maintenance not included. |
| CP_CVU_32400EAG | cPacket cVu 32400EAG aggregation and distribution network packet broker and monitoring observability node, 12.8Tbps forwarding capacity with 32x400GbE QSFP-DD ports in 1RU. Redundant AC power supplies. Low-latency monitoring with microburst analysis (cPacket cBurst) and PTP based timestamping. Maintenance not included. |

**You can learn more about cVu observability nodes at cpacket.com/packet-broker**

### About cPacket

**cPacket** de-risks IT I&O through network-aware service and security assurance across hybrid and multi-cloud environments. Our AIOps-ready Intelligent Observability Platform provides single-pane-of-glass analytics and deep network visibility required for complex IT environments enabling Fortune 500 organizations around the world to keep their business running. cPacket solutions are fully reliable, tightly integrated, and consistently simple. Our cutting-edge technology enables network, application, and security teams to proactively identify issues before negatively impacting the business. The result: increased service agility, enhanced experience assurance, and faster transactional velocity. Learn more at **cpacket.com**.

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