Product Overview

Casa Systems Distributed Access Architecture Solutions

Summary

A family of award winning Distributed Access Architecture Solutions designed to help service providers increase capacity, leverage current investments and densify access networks to flexibly deliver video, voice and data while efficiently supporting exponential bandwidth growth, ensuring customer satisfaction.

Winning and keeping residential and enterprise video and Internet services customers has never been tougher. Service providers face a range of competition in a business that requires rapid response but is still capital intensive. They need partners who are fast enough to get them ahead of their competition and committed to keeping them there, which is why more and more, leading providers depend on Casa Systems.

Casa has consistently designed today's products with tomorrow in mind, and has proven to be the most reliable partner in the industry in delivering high-performance solutions at each technology shift in cable access networks. Casa's award winning CCAP solutions were designed from the beginning to deliver gigabit+ services, enable a smooth transition from DOCSIS 3.0 to DOCSIS 3.1 and evolve to distributed access architectures that fully support CCAP voice, video, and data while simultaneously reducing operational disruption, complexity and OPEX.

Casa Systems' family of Distributed Access Architecture solutions are designed to help service providers push capacity to the edge to improve the services their subscribers enjoy, extract more value from existing investments, and maintain smooth operations in the transition from centralized to distributed access architectures.

Casa's Distributed Access Architecture (DAA) family includes:

- At the CCAP core, the CCAP Service Card (CSC), deployable in Casa's C100G or C40G chassis, which provides the complete DOCSIS and EQAM MAC functions as well as traffic aggregation for the Distributed Access nodes
- A range of Distributed Access (DA) node form factors that perform complete DOCSIS and EQAM PHY functions and can be optimally located based on service provider needs
- 10G Ethernet or 10G EPON transport between the CCAP core and the DA nodes.

Highlights

Award Winning Design
Received 2016 Diamond Technology Review Award for Distributed Access Architecture Solutions

Gigabit+ Performance
Full spectrum DOCSIS 3.1 support with 10G Ethernet or 10G EPON transport deliver 1Gbps+ to subscribers

Full CCAP
Proven and demonstrated true CCAP functionality (video, voice and data) integrated from distributed access nodes

Investment Protection
Use existing CCAP core (C40G or C100G) and existing cable modems or set-top devices

Strong Security
User data (DOCSIS and video) is all encrypted at the node. IPSec secures management/control messages between the CCAP core and DA node

Operational Simplicity
Nodes appear as an extension of the CCAP core allowing existing tools to control nodes as a single CCAP

casa systems

Transitioning from a centralized cable access architecture to a distributed network is a significant step for most service providers and raises discussion and concerns about security, performance, operational impacts, and investment protection in light of future virtualization opportunities, among others. Casa Systems understands these concerns and our solutions provide a logical approach to the challenges service providers will encounter as they make the transition.

Beyond the transition to distributed access architectures, service providers are looking for solutions that will enable a pragmatic shift from physical to virtualized cable access solutions. Casa's approach enables a graceful transition in which management and control functions can be virtualized first, followed by the virtualization of MAC functions.

Video Support
Narrowband forward and return support, along with two separate out-of-band interface pairs per CCAP Service Card

Forward Engineered
Smooth transition to virtualized end state by keeping MAC functions centralized

Feature	Benefit
Time to Market and Ease of Transition	
Designed to CableLabs' specifications, Casa's Distributed Access solutions stay within the CCAP framework and leverage existing components, enabling early deployment	Faster time to market enabled by Casa's solutions which leverage existing network components, including the C100G and C40G, are managed like current CCAP installations and require no changes to existing cable modems or set-top boxes. Less training time is required since the distributed access nodes are presented as extensions of the CCAP and managed like a single, large CCAP.
Plug and Play Deployment	At the CCAP core, with a C100G or C40G running software release 8.0 or beyond, plug in the CSC (CCAP Service Card) and make the necessary fiber connections. At the Distributed Access node site, simply connect the fiber and coax cable, then power on the node. The Distributed Access nodes are configured and managed from the CCAP core either via SNMP or CLI (on the C100G/C40G).
Operational Simplicity	
MAC Functions Stay in the Headend	Retaining the MAC functions in the headend reduces the complexity of the software in the Distributed Access nodes, which results in fewer truck rolls, reduced OPEX, and stronger system-wide security.
Management of Distributed Access Nodes Mirrors Management of a Centralized CCAP	From a management perspective, the distributed access nodes are presented as extensions of the CCAP core, and collectively managed as a single, large CCAP. In Remote MAC/PHY or Remote PHY architectures, the service provider must configure and manage a much larger set of smaller CCAPs.

Services & Throughput

Full CCAP Services Support	Casa's Distributed Access solutions support all CCAP DOCSIS and video functions including SDV, VoD and linear broadcast video. Narrowband Digital Forward (NDF) and Narrowband Digital Return (NDR) are supported for the seamless transport of (i) analog OOB signaling between legacy set-top boxes and headend set-top management systems, (ii) telemetry to nodes, power supplies and amplifiers over the digital network, and (iii) analog FM radio.
Gigabit+ Throughput	Designed for gigabit+ services, Casa's CSC can deliver 10Gbps on the optical link to the Distributed Access node and can support at least up to 32 nodes per CSC card. Casa's CSC is an 8x10G CCAP line card which supports either 10G Ethernet or 10G EPON for maximum flexibility. While Ethernet has distance advantages, EPON has other advantages such as: reduced fiber count via the standard defined WDM for transmit, receive, and analog wavelengths; and ease of supporting a star configuration anywhere within the network using passive components. Likewise, Casa's Distributed Access nodes can connect to either an Ethernet or an EPON network.

Density & Scaling

High Density Solution, Supporting 96 - 192 (or more) Distributed Access Nodes per C100G	Casa's CSC has 8x10G Ethernet/EPON interfaces. The C100G is 13 RU and can house 12 CSCs for a maximum of 96 ports, which means 96 - 192 Distributed Access nodes per C100G. Casa also offers a smaller full CCAP solution, the 6RU C40G. The C40G can house 4 CSCs for a maximum of 32 ports, which means 32 - 192 or more Distributed Access nodes per C40G.
At Least up to 192 Remote PHY Devices per C100G and C40G	Improve customer QoE through reduction of service group sizes. Because the MAC functions are provided in the CCAP core, channels can be replicated at the CSC onto multiple 10G ports allowing a service group to span multiple Distributed Access nodes.

TCO

Simple Transition to Distributed Access Architecture	Defined within the CCAP framework, the Distributed Access node supports all current CCAP services and can be introduced into the network without requiring changes to existing cable modems or set-top devices. Casa's plug-and-play solutions enable the simplest transition to distributed access architectures. The only additional equipment required for Casa's distributed access solution at the headend / hub is the CSC 8x10G line card.
Simplified Management and Operations	Because the Distributed Access nodes are managed as an extension of the existing CCAP architecture, and existing DOCSIS MIBs remain unchanged, overall management of the system is virtually identical to what's deployed today, reducing costs associated with downtime for learning curves. Keeping the MAC functions in the headend reduces the complexity of software in the node, which can reduce the number of truck rolls required for upgrades and failures, saving costs and reducing impacts to subscribers. MAC functions have historically changed more frequently and more dramatically than PHY functions in each new generation of standards. Keeping these functions in the headend also eases the path to virtualization in the future.

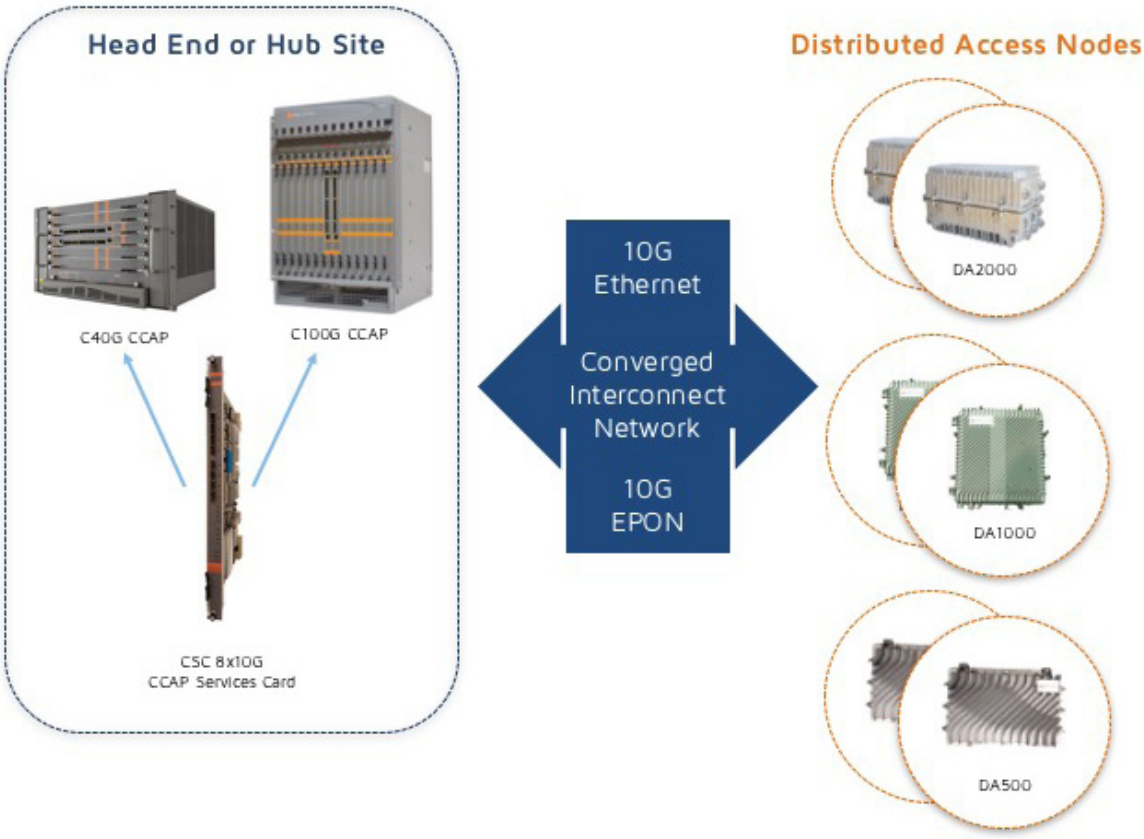
Security

Strong Security at Every Point	An advantage of Casa's Distributed Access Architecture is that the intelligence is centralized in the headend, making the system as a whole more secure than alternative approaches. Distributed Access nodes are managed from the CCAP core. Management/control traffic between the CCAP core and Distributed Access Node is secured by IPSec to guard against man-in-the-middle attacks. User data is secured by DOCSIS BPI+ protocol. Video content is encrypted in the CSC with support for DVB Simulcrypt, PME and PKE.

Road to the Future

Path to Virtualization	Keeping MAC functions centralized enables a more graceful transition toward virtualized network functions. Casa's roadmap from today's distributed access architectures to virtualization of key network functions is clearly defined and takes advantage of a winning design that keeps our customers ahead of their competitors.

Figure 1



Distributed Access Architecture Components

At the CCAP core, Casa's Distributed Access solution requires the addition of a new card, the CCAP Services Card, or CSC 8x10G. The CSC provides DOCSIS and EQAM MAC functions and performs traffic aggregation for the Distributed Access (DA) nodes. The CSC supports either 10G Ethernet or 10G EPON connectivity to the DA nodes. Casa provides a range of sizes of DA nodes to provider service providers flexibility. The DA2000, shown at the top right, in figure 1, can be equipped with either 1 or 2 Remote PHY modules and is ideal for single-family housing. The DA1000, shown at the center right, in figure 1, is equipped with 1 Remote PHY module and is ideal for MDUs or business subscribers. The DA500, shown at the bottom right, in figure 1, is a lower powered node equipped with 1 Remote PHY module.

Technical Specifications

Please refer to the following for the technical specifications of each of the components of Casa's Distributed Access solution: C40G CCAP, C100G CCAP, CCAP Services Card (CSC8x10G), and the DA2000/DA1000/DA500 Distributed Access Nodes Datasheets