Kollective for Configuration Manager Technical Brief

Summary and Benefits

Kollective integrates with Microsoft System Center Configuration Manager (SCCM) to efficiently deliver content and images to Pre-boot Execution Environment (PXE) clients. The technology leverages Kollective's cloud-based, peer-to-peer Enterprise Content Delivery Network (ECDN) to effectively scale software updates to the edge of your network without the need to purchase hardware or invest in infrastructure upgrades.

Through its cloud-based architecture, network efficiencies, ability to self-optimize, and work completely in the background to other network traffic, the Kollective for Configuration Manager solution provides the following benefits to IT organizations and desktop management teams:

Business Benefits

- Lower the cost of capital equipment by reducing hardware infrastructure and total cost of ownership (TCO)
- Lower the cost of operations by streamlining software delivery processes, reducing IT support tickets t resulting from software updates and off-hours maintenance work
- Lower the cost of connectivity by reducing the bandwidth needed to scale software delivery
- Unlimited cloud usage and no egress fees for software delivery
- Increase security compliance with 70% faster patch deployments
- Updates run entirely in the background, providing a high-quality user experience
- Eliminate the remote office challenge and deliver the same level of support, service and experience provided to users located at Head Quarters

Technical Benefits

- Cloud-based content delivery solution for Configuration Manager
- Full OSD lifecycle support – Windows Preinstallation Environment (WinPE) Agent & PXE client
- Intelligent and dynamic peer-to-peer technology that requires little to no out-of-the-box configuration
- Significantly reduced operational overhead by eliminating the need to pre-stage content to distribution points
- Reduction in Configuration Manager TCO by eliminating servers hosting distribution points and PXE enabled Distribution Points
- Automatic network intelligence eliminates the need to define network boundaries and allows administrators to simplify boundaries and boundary groups.
- Smart and resilient network protocol which dynamically throttles itself when network saturation is detected and has a high-level of reliability when traversing high-latency connections
- Supports all Configuration Manager content types including OSD content during WinPE.
- Advanced analytics platform with dashboards and reports; includes delivery metrics, bandwidth savings and network efficiency
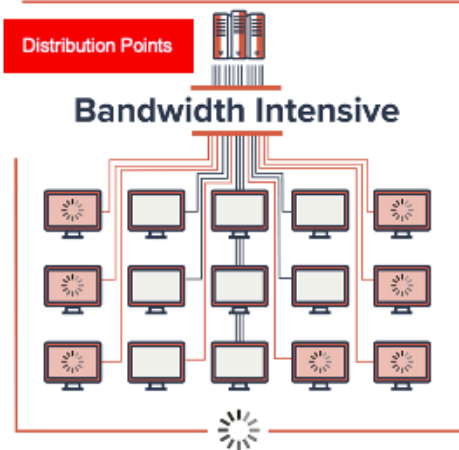
Without Kollective vs With Kollective

Kollective for Configuration Manager automatically creates a mesh peering grid – no manual configuration required. Out technology leverages a cloud-native architecture to work around chokepoints in your network and distribute bandwidth-heavy content to machines. Once a single copy is downloaded from the cloud, local copies are shared across the Local Area Network (LAN) through intelligent peering. Kollective for Configuration Manager can self-optimize, self-scale and self-heal to adjust to changes in traffic patterns or physical changes to the network to ensure delivery.
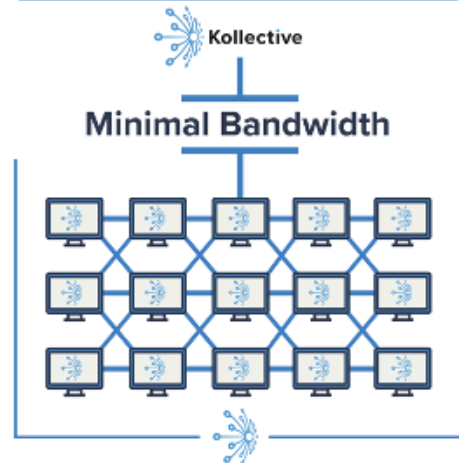
WITHOUT KOLLECTIVE
(Hardware Required)

Full OSD Lifecycle · Windows as a Service · Line of Business Applications · Patch & Security Updates
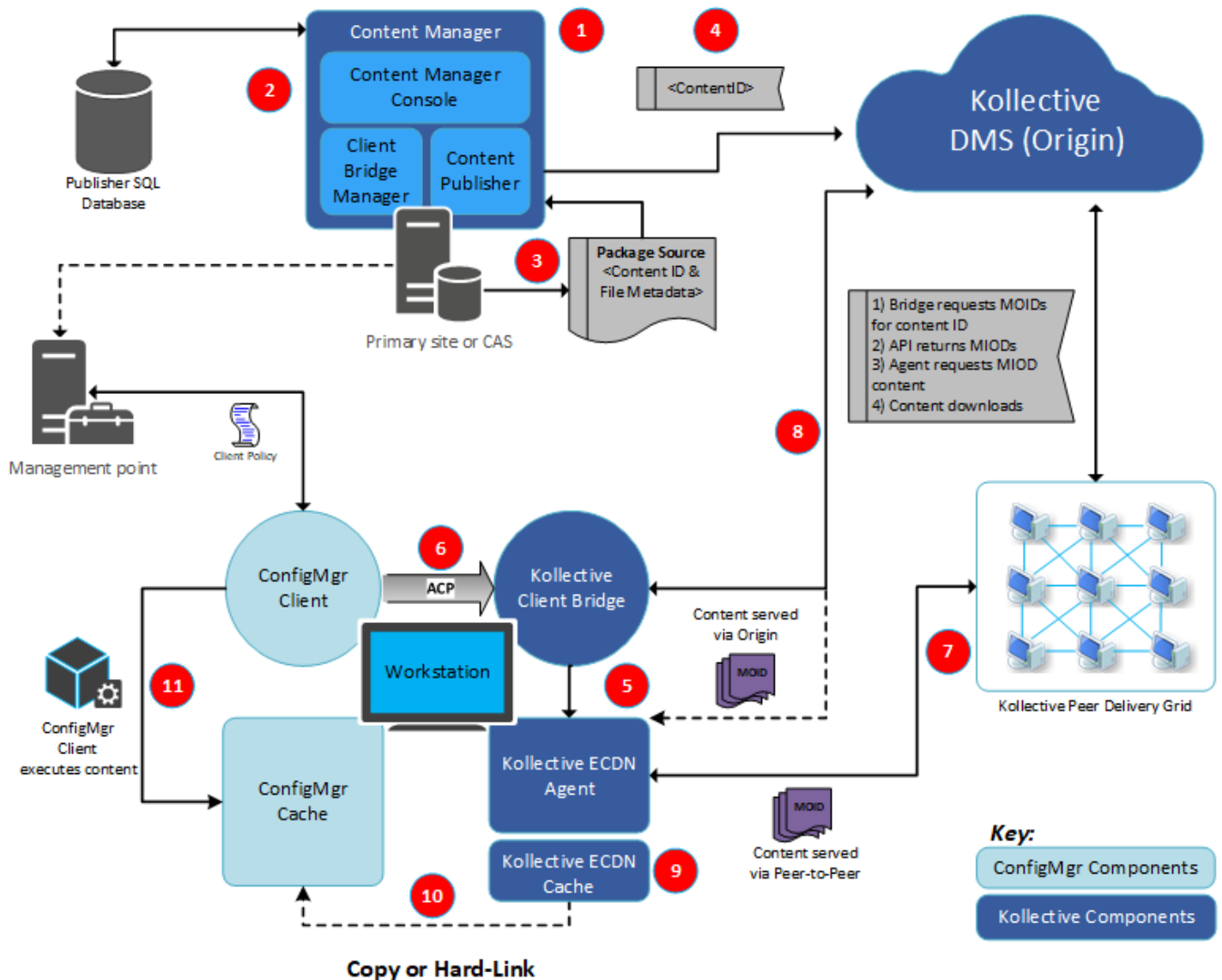
Distribution Points

Bandwidth Intensive

WITH KOLLECTIVE
(Software Defined, No Hardware Required)

Full OSD Lifecycle · Windows as a Service · Line of Business Applications · Patch & Security Updates

Kollective

Minimal Bandwidth

High level Architecture Overview

The following steps illustrate the architecture of the solution and the flow of content delivery.

1. The Content Manager is installed on a site server hosting the SMS Provider role
2. The Content Manager Console provides administrative control(s) of all Publisher component configuration actions
3. When Configuration Manager content is published, the Content Publisher component compresses content from the content item's package source folder
4. The Content Manager Publisher tags each file with a unique ID and uploads it to the Kollective ECDN
5. On the machine running the Configuration Manager Client, the Kollective Agent and Client Bridge are installed, and the Client Bridge is registered as an Alternate Content Provider (ACP)
6. When a Configuration Manager Client receives policy that requires it to download and install content, the Configuration Manager Client invokes the ACP/Client Bridge to retrieve the content
7. The Client Bridge/Agent requests the location of the content from the Kollective ECDN. If the content is available on a well-connected peer, it will be downloaded from the peer
8. If the content is unavailable on a well-connected peer, the agent will download the content from the Kollective DMS (Delivery Management System) Origin Grid Server(s)
9. When the Kollective Agent retrieves the content, it stores it in the Kollective Agent cache
10. The Kollective Agent notifies the Client Bridge that the content download is complete, then the Client Bridge either creates a hard link or copies the content to the Configuration Manager Client cache

11. The Client Bridge notifies the Content Transfer Manager component in the Configuration Manager Client that the download is complete; the Configuration Manager Client then executes any actions associated with the content

Protocols & Intelligence

Kollective Delivery Protocol (KDP)

KDP is designed and tuned to ensure that high-quality peering is achieved for all content payloads.

- High fault tolerance – TCP encapsulated within UDP minimizes packet loss
- Equipped to deal with high-latency network links – Latency of 1000ms at 2% packet loss enables effective peering delivered to the most challenging networks
- KDP encrypted payload – 2048 bit public/private keys pairs between our origin and client peers maintains high data integrity

Dynamic Throttling

KDP constantly monitors network availability throughputs to harvest available bandwidth for efficient content delivery.

- Reliably harvests available bandwidth without disrupting service
- Built-in QoS (Quality of Service) – Prioritization of live video content to support a great user experience
- Eradicate network saturation with dynamic content controls

Intelligent Peering

Cloud-based, intelligent peering enables robust and efficient client peering meshes to form across your network. This method delivers high bandwidth savings and peering efficiency for each content deployment.

- Software defined network – All peering controls deployed and controlled at the software layer for fast and cost-effective implementation, without additional hardware
- Cloud-based orchestration servers combine agent data to ensure peering mesh is optimized for efficient content delivery
- Dynamic client peering formation adapts to changing network conditions as they happen
- Client is served directly from origin servers and provides resilient fallback mechanism for poor delivery performance or roaming clients

Granular Control and Configuration

Kollective for Configuration Manager is a simple, software defined solution that easily integrates to your existing Configuration Manager infrastructure.

- Easy to install site system software components
- Lightweight client agent bridge can easily be deployed at scale via Configuration Manager or target specific areas of your organization

Hundreds of built-in peering controls ensure that the peering delivery mesh works in harmony with all complex network topologies, regardless of size.

Publisher Administrative Console

The administrative console is a single interface to manage and view the status of all of content and packages published to the Kollective ECDN. View packages and status, with the ability to click through to details.

End-to-End OSD Lifecycle Support

Kollective for Configuration Manager integrates with SCCM to streamline and automate your existing Operating System Deployment (OSD) processes, providing an end-to-end lifecycle. From bare metal machines to post-deployment analytics and monitoring, you'll have a complete view of your OSD lifecycle.
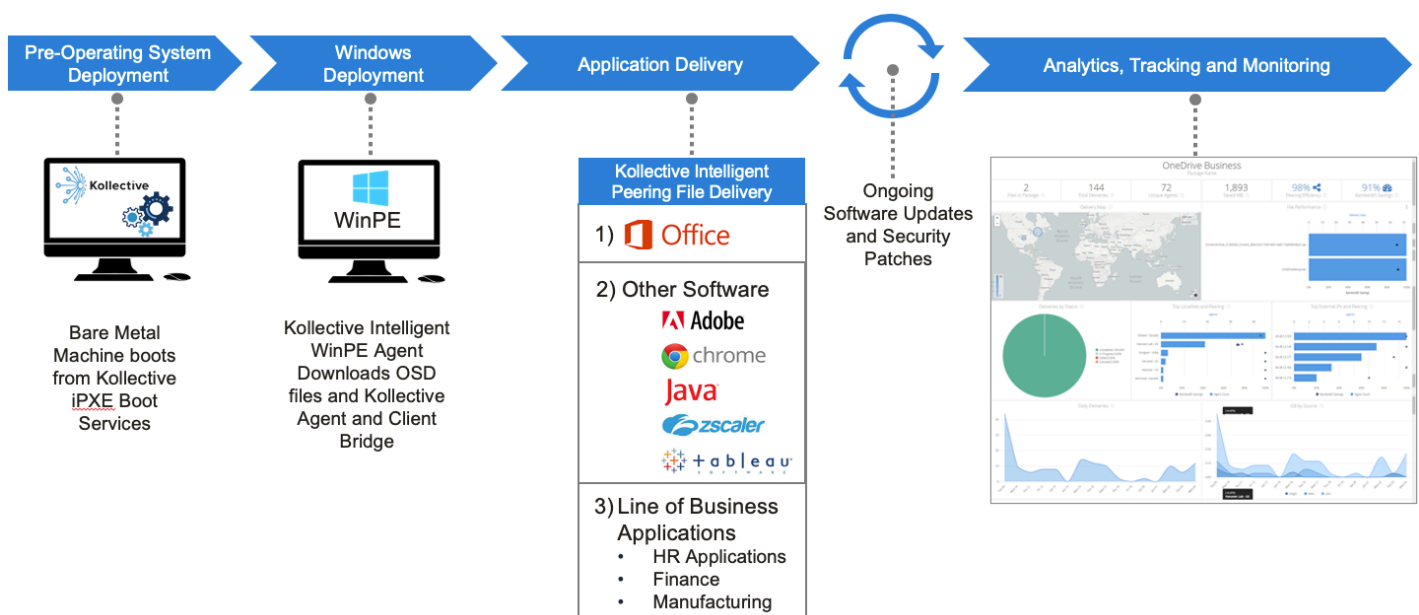
- Fully automate windows deployments without complex infrastructure
- Efficient delivery of image files reducing network congestion
- Monitor and review image deployment performance in real-time

Kollective OSD End-to-end lifecycle

| Corporate Bare Metal Image Deployment Services | Kollective PXE Boot Services iPXE / TFTP | Kollective WinPE agent support | Kollective intelligent peering WIM delivery | Kollective full Windows agent |

Pre Operating System Deployment | Windows Deployment | Windows Setup / Configuration
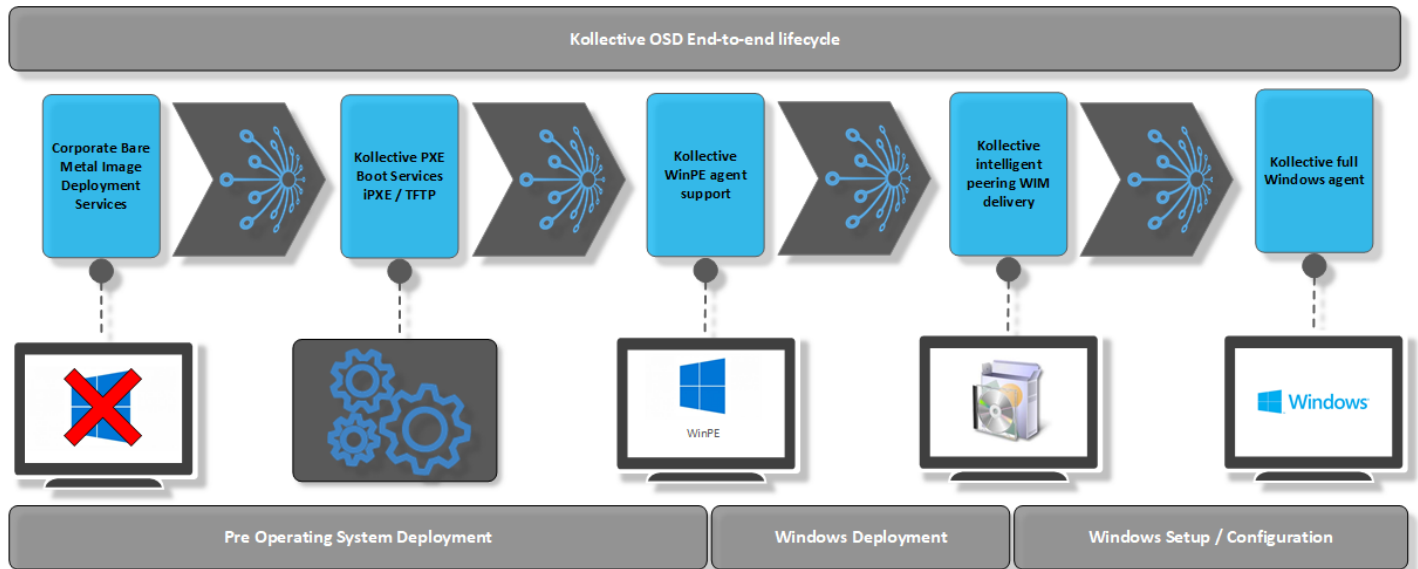
Client-Based PXE Boot Support

Kollective's client-based PXE solution supplies the capabilities needed to support full network boot services without the need for distribution points. The software-defined solution empowers admins to control which clients (per each sub-net) act as the provider, while our intelligent agent reports boot services to the client boot manger to provide a centralized management model.

Content Manager

Client Bridge Manager

Content Publisher API

Content Manager Console

Publisher DB

Primary site or CAS

Package Source

WMI

SQL

ECDN Cloud

Task Sequence / Boot Action Query

DHCP Request TFTP

PXE Client

iPXE   TFTP

Network Boot Services

HTTP Boot Image Transfer

Leader

SCCM Client   Client Bridge   KAgent

CCM Cache   Boot Image Cache   KAgent Cache

Follower

Client Bridge

Broadcast Domain
DHCP Discover & Offer / Leader Election

Key:
ConfigMgr Components
Kollective Components

The following steps illustrate the architecture of the Kollective PXE Boot Services solution.

1. A PXE booting client requests a DHCP response to boot
2. The Client Bridge Leader receives DHCP broadcast
3. The Client Bridge Leader sends MAC Address and SMBIOSGUID to the Client Bridge Manager requesting boot response and boot image ID
4. The Client Bridge Manager responds with the boot action, task sequence deployment type, and boot image ID
5. If the Client Bridge Leader does not have the boot image, it will either download it from the ECDN or a peer(5a)

The Client Bridge Leader responds to the PXE booting client and allows the HTTP (or TFTP) transfer of the required boot image

Kollective PXE client listens and responds to 'option 60' PXE requests. Once a PXE request is initiated the client bridge communicates with the bridge manager to verify boot action and boot image information.

- Dynamic election process ensuring PXE provider on every subnet without administrative designation
- Removes hardware for WDS services
- Configure PXE responders to use either TFTP or PXE to meet your individual needs

WinPE Agent

The capabilities of Kollective for Configuration Manager extend beyond content deliveries to provide full OSD support. Our integrated WinPE agent is invoked to download and deliver task sequence content during the install and set-up phases of operating system deployment.

- Task sequence variables simplify integrating the Kollective agent into existing build processes
- Supports x86 and x64 boot image architectures
- Lightweight utility agent is easy to slipstream into your existing boot images

Cloud / CMG

Kollective's cloud-based SCCM integration allows you to easily extend your content delivery reach beyond the internal network boundary. Traditionally, content delivery in this scenario is challenging due to limitations on VPN connections. Now you can extend efficient content delivery by utilizing Azure Cloud Management Gateway (CMG), ensuring roaming devices stay up to date, efficiently, and without unpredictable data egress charges.
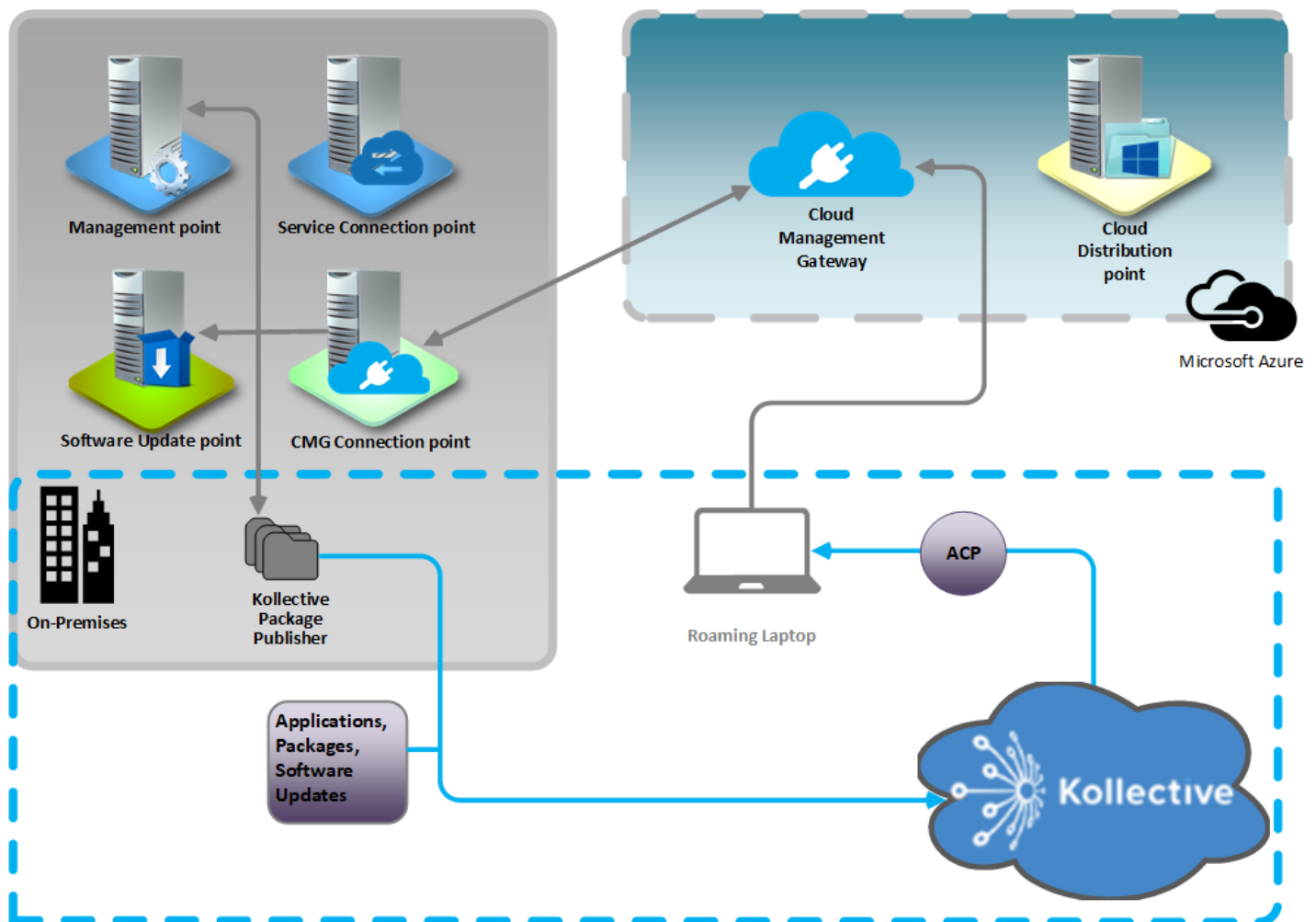
- Cloud-based solution allows you to offload content delivery to devices roaming outside of the corporate network boundary
- Ensure all devices are easy to reach to receive critical security updates to minimize the threat surface and maximize your security compliance
- Avoid unpredictable costs for data egress flows – all data flows via the Kollective Content Delivery Network (CDN)(
- Set a new standard for content delivery for your remote workers
- Benefit from efficient peer-to-peer delivery for small remote offices

Analytics and Monitoring for Software Delivery

Kollective for Configuration Manager provides a robust analytics platform that allows you to easily create dashboards and reports to monitor your software deployments. All summary data is fully connected, allowing you to drill-down to view details. Analytics supplies the metrics your organization needs to better understand network performance and verify the success of deliveries.

With Kollective for Configuration Manager you will gain valuable insights on file and package delivery across your network.

- Dashboards and custom reports to measure your KPIs
- View the status of every file or package, with the ability to quickly identify and drill down to see details of areas that need attention.
- Data visualizations to monitor trends and performance over time
- View the top localities, peering efficiency and bandwidth savings across your network

FAQ

Does Kollective support all Configuration Manager content types?

Answer: *Yes, Kollective for Configuration Manager can intelligently deploy all Configuration Manager content types, including operating system deployments (OSD) using our peer-to-peer PXE and Kollective WinPE components. Software updates, legacy packages, applications, drivers and all OSD components.*

Do I need additional hardware?

Answer: *No, Kollective for Configuration Manager is a fully software-defined solution which is simply installed onto your Primary / CAS (Central Administration Server) site system. In fact, K4CM will significantly reduce your Configuration Manager infrastructure by removing costly distribution points.*

How can Kollective help eliminate my distribution points?

Answer: *Kollective for Configuration Manager provides a software-defined, intelligent peer-to-peer solution which delivers content quickly and efficiently to the edge of your environment. Each deployment endpoint can effectively serve content to other requestors, reducing the need to support costly distribution point infrastructure and offloading network resources away from the Wide Area Network (WAN).*

Does Kollective support cloud?

Answer: *Kollective for Configuration Manager can support organizations choosing to extend their Configuration Manager reach into the cloud. Our cloud-based solution supports CMG integrations and remote offices/workers by delivering fast and efficient content direct from the cloud.*

Can we gain insights for how Kollective performs with content delivery?

Answer: *Our Kollective IQ analytics platform provides real-time visibility of delivery metrics to system administrators for each deployment job. Kollective IQ will provide network insights for peering efficiencies, overall bandwidth savings and geographic status of content deployments throughout your estate.*

Can Kollective help improve our security patching compliance?

Answer: *Kollective for Configuration Manager leverages class-leading peer-to-peer content deliveries, ensuring that content is efficiently deployed at speed and scale throughout your environment without disrupting your network and business-as-usual activities. Utilizing our peer-to-peer content delivery mesh increases the speed and coverage for content to reach target endpoints, ensuring greater reach in shorter timescales, reducing your attack surface and providing more time for compatibility testing.*

How can Kollective help with unprecedented numbers of remote workers?

Answer: *Kollective's cloud-native solution removes existing constraints for remote workers by efficiently delivering content directly from cloud origin CDNs. This enables you to easily scale your content delivery capabilities to remote workforces and ensure system integrity and productivity is maintained.*

Can Kollective help reduce operational overheads?

Answer: *Kollective for Configuration Manager can eliminate up to 90% of your existing distribution point infrastructure and help upscale operational effectiveness. Additionally, by eliminating Distribution Point infrastructure you can also simplify Configuration Manager administration such as Configuration Manager site boundary mapping, leading to volume reductions of support requests and costs.*

Kollective for Configuration Manager Technical Brief

Document Created: 5 August, 2020

Last Modified: 9 August, 2020

-