
## Agenda

- What is a VOD?
- How is a VOD created?
- How is it accessed?
- What do I sell?

# What is a VOD?

- Video On Demand
- Combination
  - Video / Audio
  - PowerPoint Slides
  - Easy Navigation





# Cisco Use

Content Engine Product Line

Video On Demand

Cisco Systems

CEC HOME | AREA HOME | WHAT'S NEW | INDEX | SEARCH | FEEDBACK | HELP

Please select a bit rate -

| Title | Bit Rates | Length |
|---|---|---|
| Content Engine Product Line | 14K Audio Only<br>56K Video | 00:54:25 |

Additional Resources

Windows Media Player Plug-in

Preview Powerpoint Presentation | Download Powerpoint Presentation | Downloadable Audio Only

**700 a month new VODs created and growing!**

## How is a VOD Created?

*You Need*

- A Personal Computer with a Digitizer card and software
- A microphone and/or a camera
- Proper lighting
- Slide authoring software




## Audio/Slide VOD

*Hotfoot from Digital Lava*

- Simple to get started
- Audio inserted into PowerPoint slides
- www.digitallava.com

## Video/Audio/Slide VOD

*gForce Author and Studio*

**Video** and **Audio** recording

**PowerPoint** slide integration

**Complete authoring** solution

**www.gforce.com**





## What do I Sell?

***VOD Content Authoring Tools***

***Web Servers and Services***

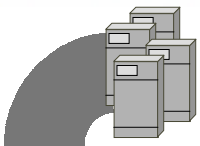
**Cisco Content Delivery Networking**

# Agenda

- Customer Problems
- CDN Overview
- Content Delivery and Caching
- Case Studies
- CDN Products

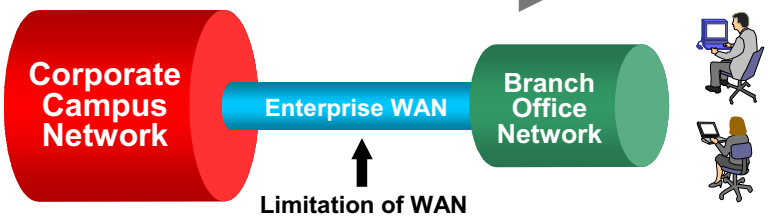



# Key Challenge to Scale
## *for Internal Enterprise Applications*

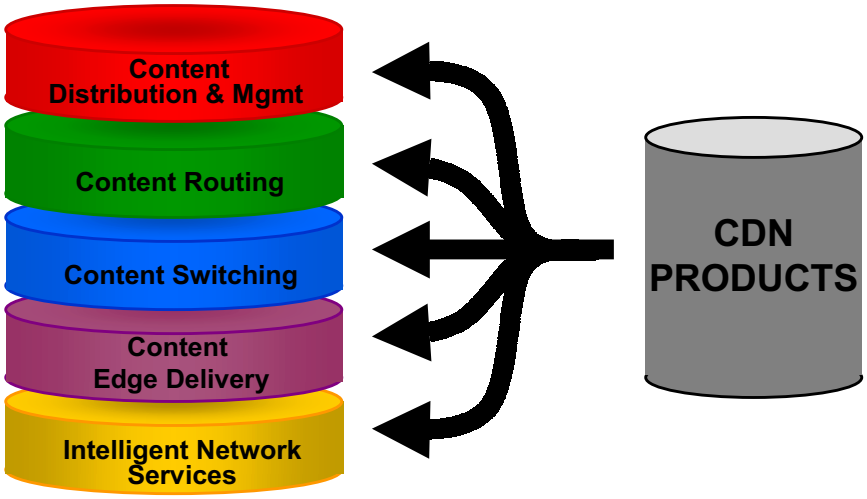


Bandwidth Intensive Applications

Simultaneous access inhibited by costly Enterprise WAN



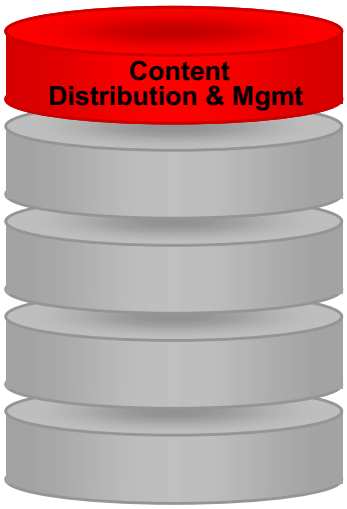
## CDN의 5대 서비스 요소





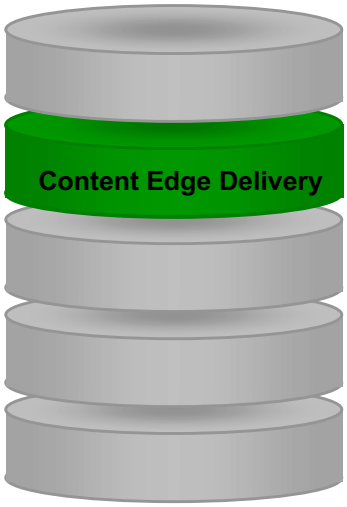


## 5 Key Service Elements
### *Content Distribution & Mgmt*




- Global centralized provisioning for content distribution
- Import, encode and automatically distribute content to network edge
- Bandwidth and configuration management for delivery nodes at network edges

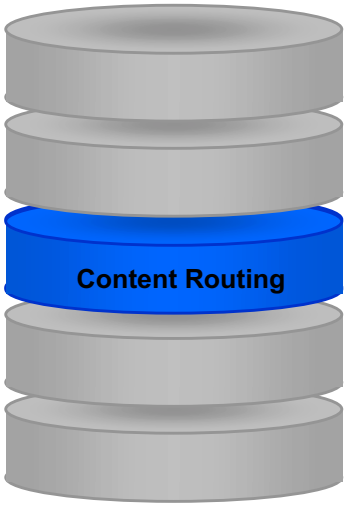
# 5 Key Service Elements
## *Content Edge Delivery*




- Import content and maintain copies at edge of network
- Seamlessly deliver content of any type from network edge to desktops or kiosks
- Provide content serving, streaming, and transparent caching all in one
- "Appliance" technology

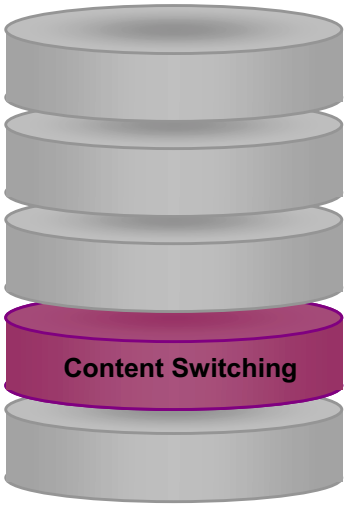



# 5 Key Service Elements
## *Content Routing*




- Reliably route user requests for content to the best site across a CDN
- Metrics include: presence of content, geographic proximity, network conditions, POP load, Content Engine load measure of performance and usage
- Adaptive routing around failures/congestion

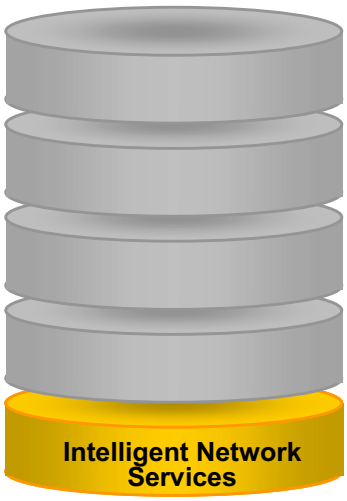
# 5 Key Service Elements
## *Content Switching*




- Intelligently switch traffic across origin servers for load balancing
- Layer 5-7 services for intelligent load distribution
- Content verification services to ensure content validity, availability and load on server
- 'Flash Crowd' support for dynamic provisioning of content

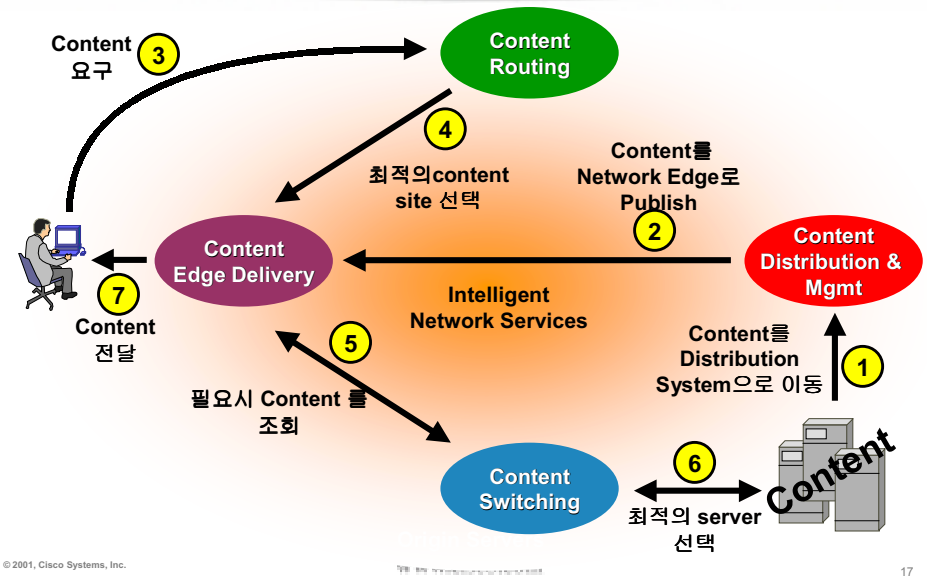



# 5 Key Elements
## *Intelligent Network Services*




- Intelligence within the Cisco IP infrastructure
- Required to build reliable and scalable Cisco CDNs
- A solid layer 2/3 core Cisco infrastructure is a key requirement
- Examples of Cisco's intelligent network services include NBAR, QoS, VPNs, Security, and Multicast

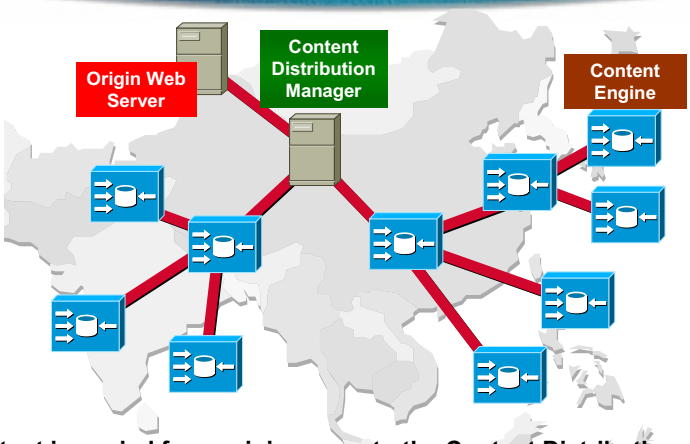
# CDN 기능 개요






17

# Content Distribution

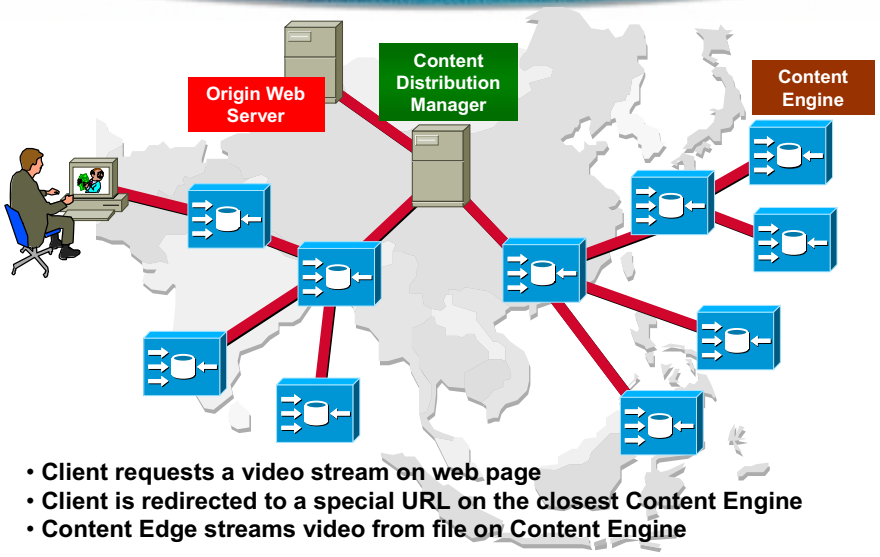



- Content is copied from origin server to the Content Distribution Manager and replicated to Content Engine at the edge
- Bandwidth used during content distribution can be limited
- Distribution can be scheduled during non-peak hours of the day



18

# Content on Demand

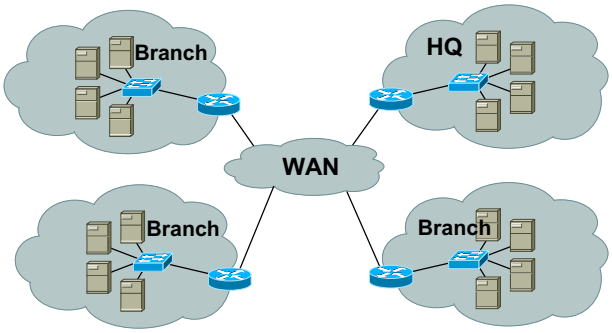



- Client requests a video stream on web page
- Client is redirected to a special URL on the closest Content Engine
- Content Edge streams video from file on Content Engine



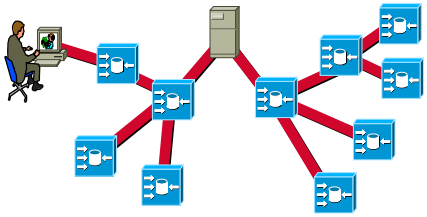

# Content Delivery - Traditional Approach

- Duplicate Server Farms/Data Centers
- Expensive to own and maintain (hardware, OS, apps, bandwidth)
- Skilled professionals not available at remote sites
- "Manual" distribution of content



# Cisco CDN Approach: Intelligent Content Delivery

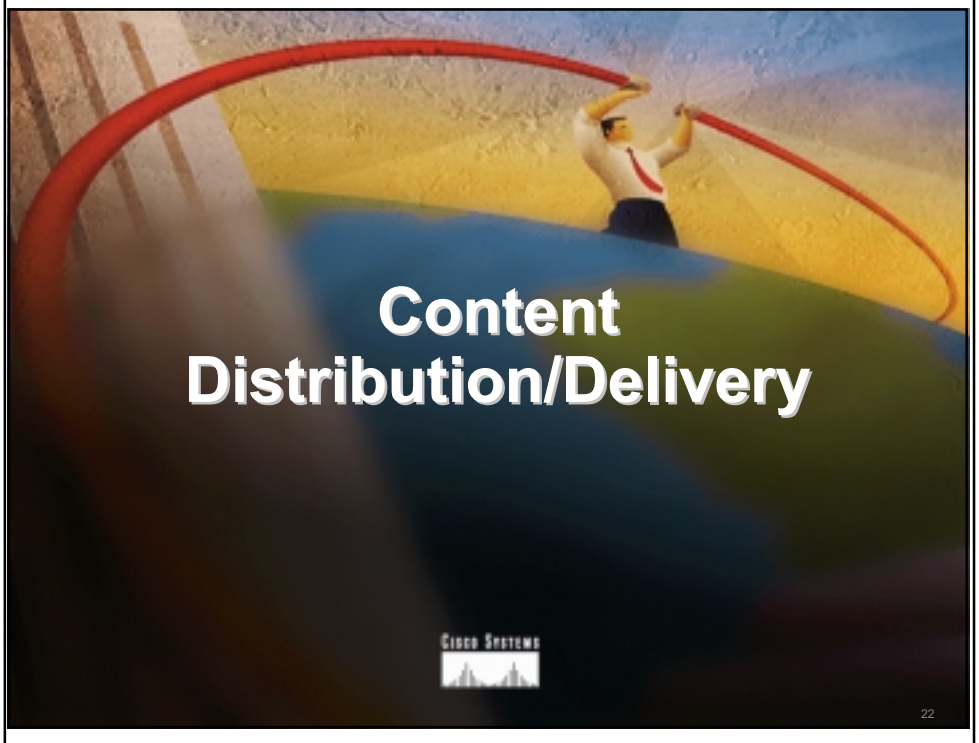
- Control content *centrally*, distribute content *locally*
- Automate media distribution through centralized policy
- Deliver any rich media, TV-quality video streaming
- Built on zero-administration zero-maintenance device
- Zero incremental WAN bandwidth
- Completely Web integrated

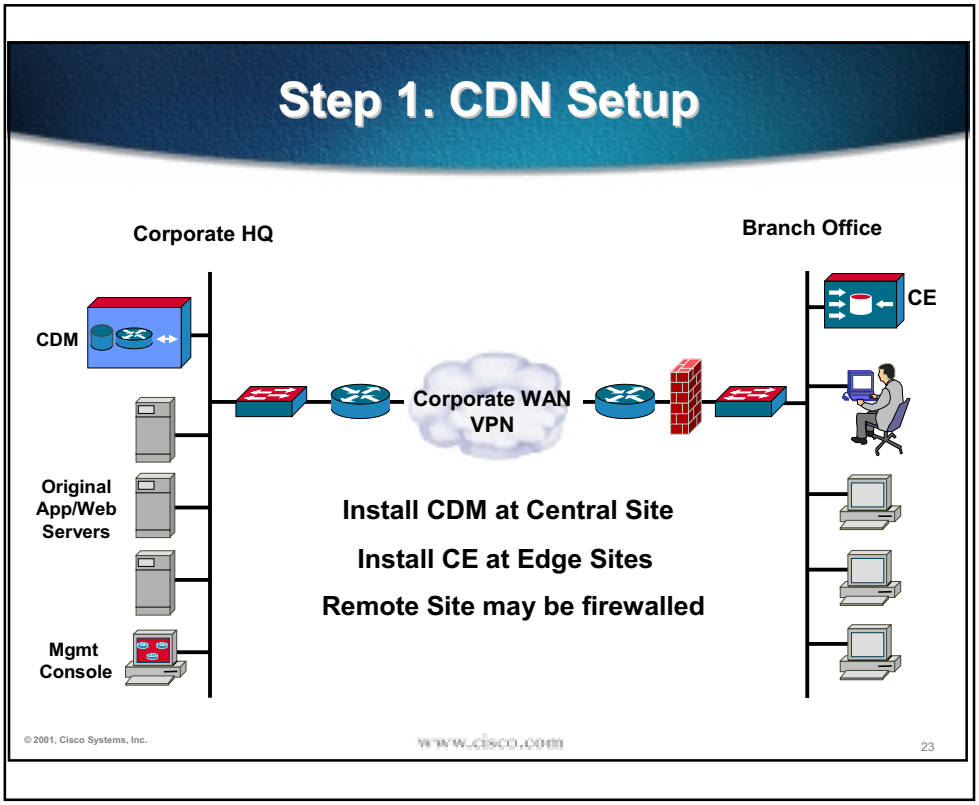


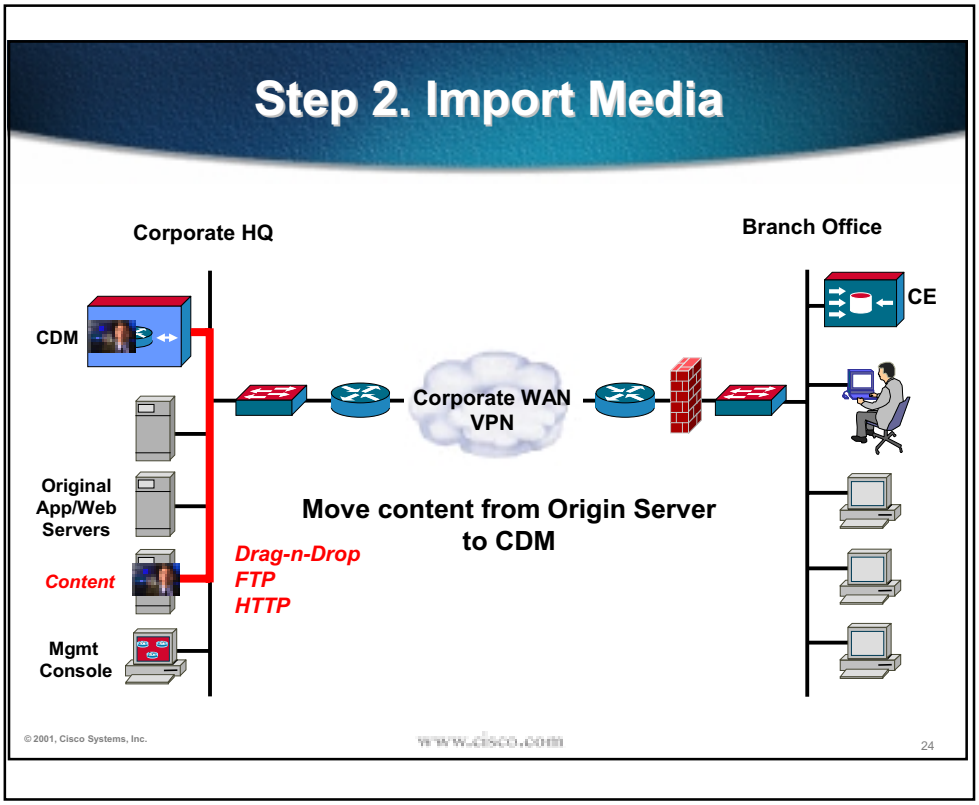


www.cisco.com

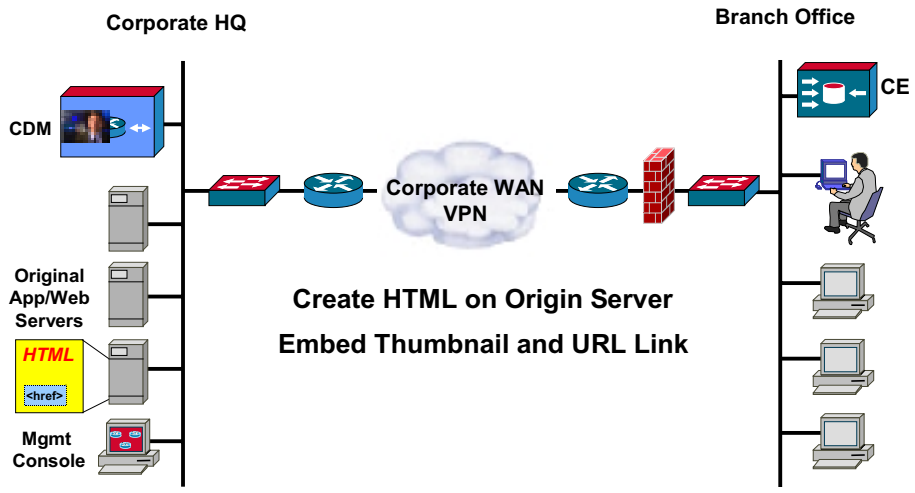
21





# Step 3. HTML Modification

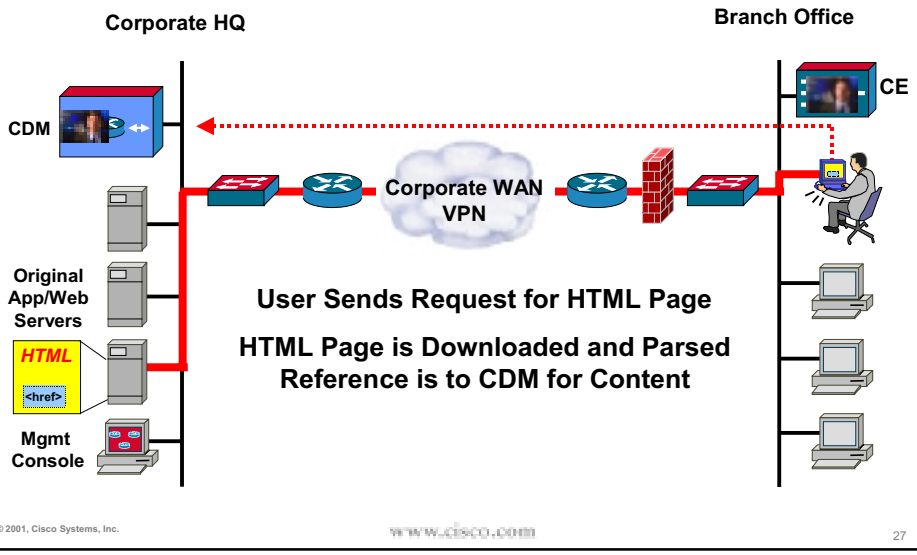






# Step 4. Content Replication

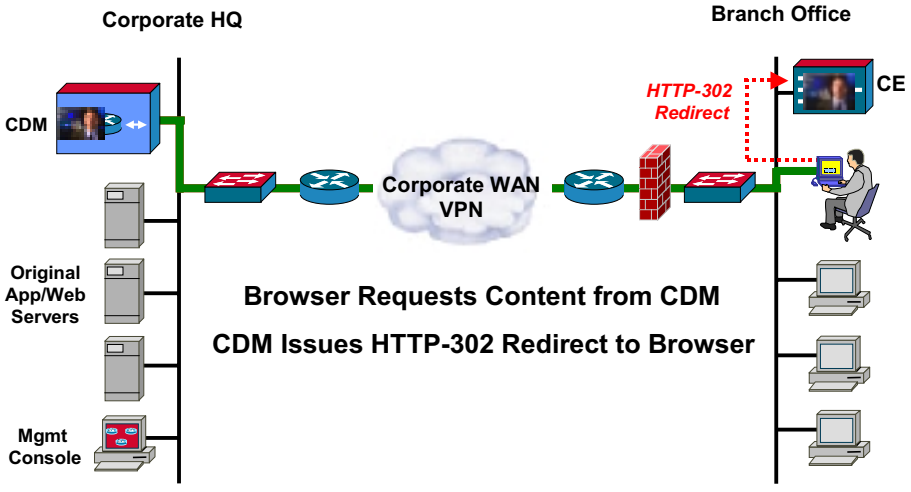
# Step 5. User Sends Request

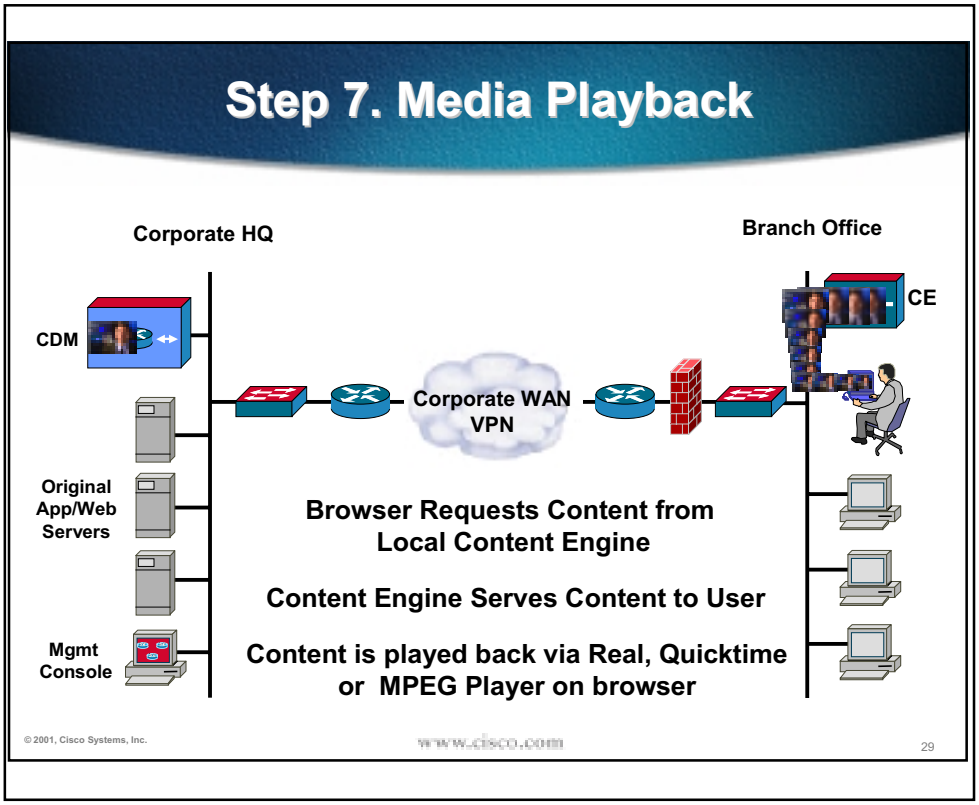


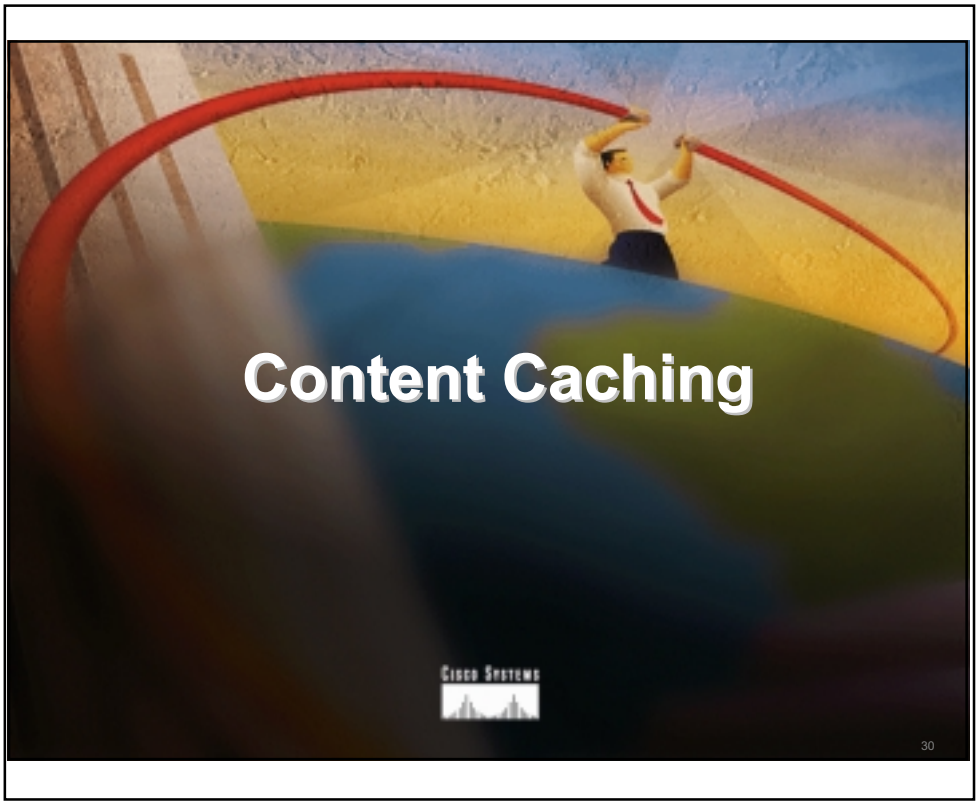




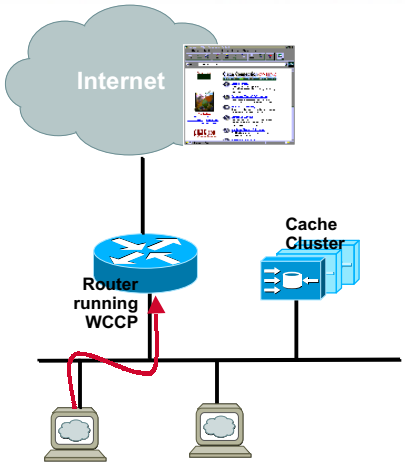
# Step 6. Redirection to Content





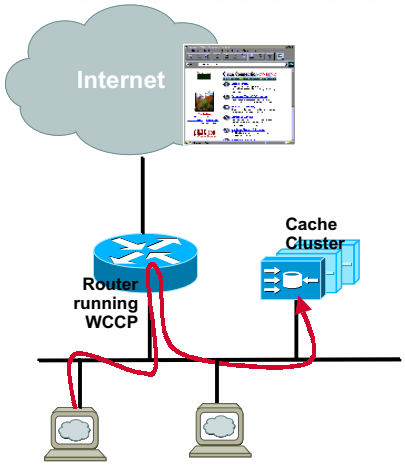
# Transparent Network Caching




- Connection initiated from web-browser

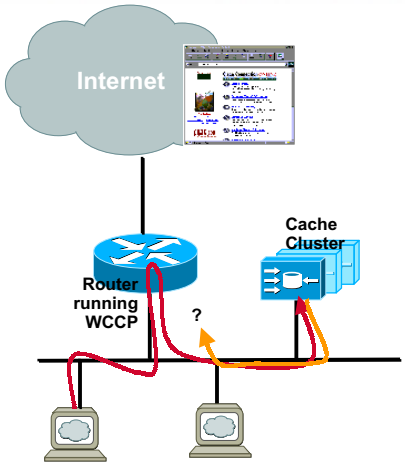



# Transparent Network Caching




- Connection initiated from web-browser
- Router ***intercepts*** flow and redirects it to new location
  (the original packet is encapsulated unchanged within a GRE frame)

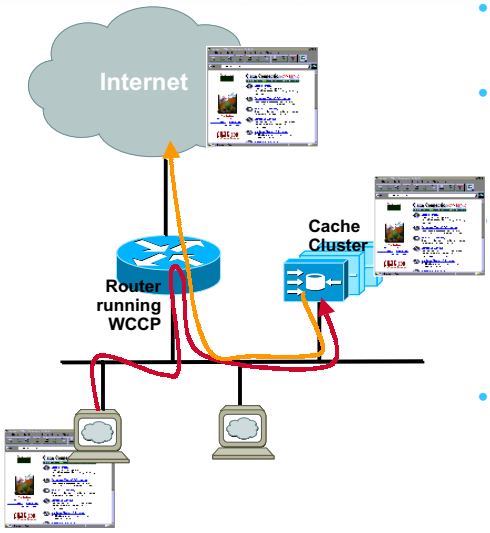
# Transparent Network Caching




- Connection initiated from web-browser
- Router *intercepts* flow and redirects it to new location
  (the original packet is encapsulated unchanged within a GRE frame)
- **Device that flow is redirected to can choose what to do with flow --**
  - **–send somewhere else**
  - **–masquerade as real server**

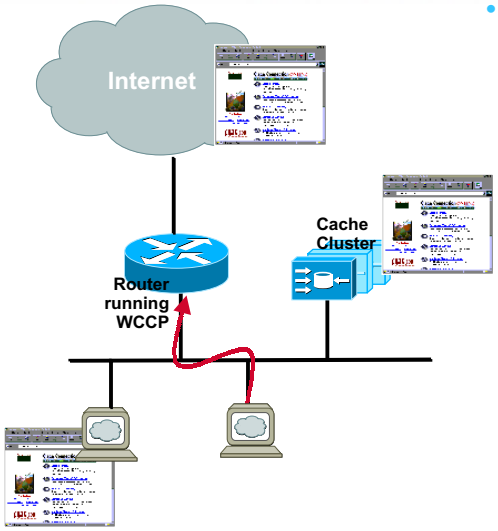



# Transparent Network Caching




- Connection initiated from web-browser
- Router *intercepts* flow and redirects it to new location
  (the original packet is encapsulated unchanged within a GRE frame)
- Device that flow is redirected to can choose what to do with flow --
  - –send somewhere else
  - –masquerade as real server
- **Content Engine will serve flow (in case of *hit*), will initiate second flow if a *miss***

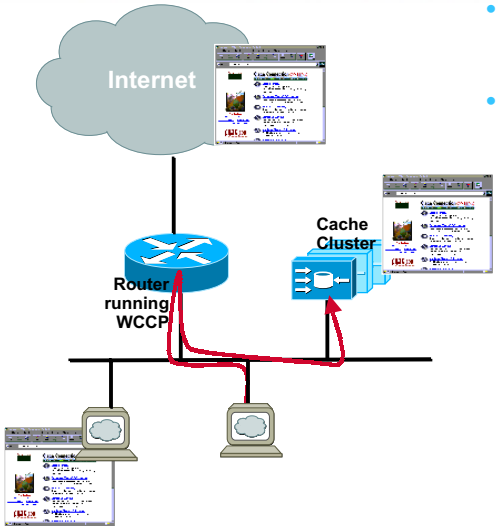
# Transparent Network Caching -- subsequent requests




- Connection initiated from web-browser

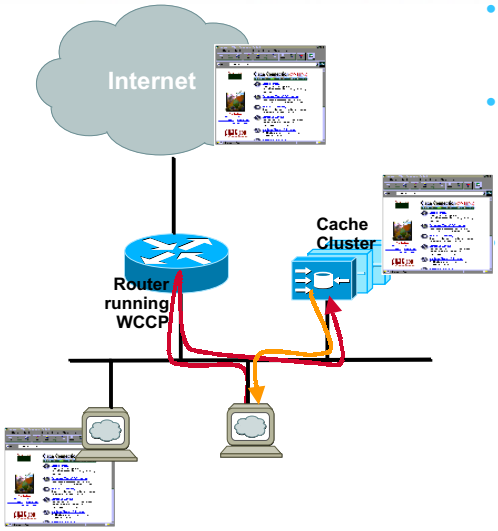



# Transparent Network Caching -- subsequent requests




- Connection initiated from web-browser
- Router ***intercepts*** flow and redirects it to new location
  (the original packet is encapsulated unchanged within a GRE frame)

# Transparent Network Caching -- subsequent requests




- Connection initiated from web-browser
- Router *intercepts* flow and redirects it to new location
  (the original packet is encapsulated unchanged within a GRE frame)

**Content Engine masquerades as the web-server. Object is served locally from the cache**




# Positioning of IP/TV and CDM/CE

- **IP/TV is best for live broadcast events using IP Multicast, while also recording events to feed into the CDM**
- **CDM/CEs are best for large VOD deployments because of its efficient file distribution**


## Applications

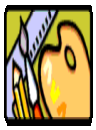
**Education**

- University
- Community College
- K-12

**Fortune 1000**

- Finance
- Retail
- High Tech
- Healthcare

**Professional Services**



- Advertising
- Media Production
- Content Providers

**Government**

- State, Local, Federal

**Live and On-demand Distance Learning, e-Learning, Corporate Communications, Partner/Supplier Training/Communications, Retail, Kiosks, Documentation Delivery, VoD, MoD**

## Case Study: PRIMEDIA Workplace Learning

**The Problem:**

- Finding a Web solution for their customers that could match the quality of satellite distribution
- Distributing content and knowledge throughout their own organization, quickly and affordably
- Leveraging 42,000 media assets (programs) to generate new revenue streams

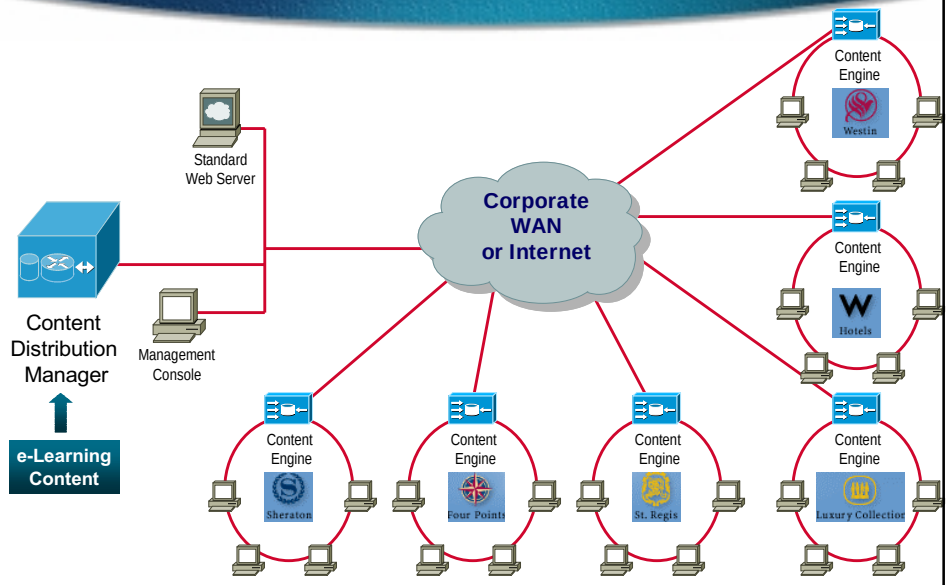



## Case Study: PRIMEDIA Workplace Learning

**The Solution:**

- Leverage the Web to make training content available to customers simply and affordably
- Use CDN devices on customers' LAN to stream training content on-demand at TV-quality
- Make technology transparent to employees and other end users by using standard web tools
- Leverage existing network infrastructure, instead of rebuilding the network

## Starwood Hotels + Resorts








## Case Study: Central Wyoming College

**The Problem:**

- **Providing a high-quality curriculum with limited resources**
- **Engaging students with new technology**
- **Building a system that withstands nature and geographical obstacles**
- **Delivering quality content to the desktop, without rebuilding the network infrastructure**

# Case Study: Central Wyoming College

**The Solution:**

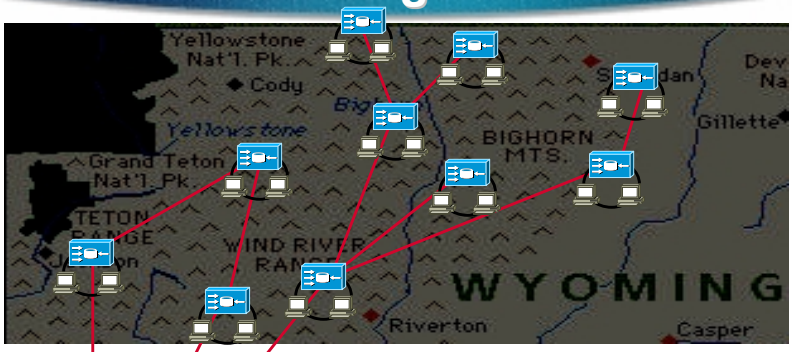
- **Use TV-quality video to grab students' attention**
- **Deliver content by simply connecting a CDN device at each school**
- **Use existing network infrastructure**

  **T1 WAN**

  **10/100 Ethernet LANs**
- **Make technology transparent to students, teachers by using standard web tools**




# Case Study: Central Wyoming College




CENTRAL Wyoming COLLEGE

Corporate WAN or Internet

Content Distribution Manager

# CDN vs 2M Link Upgrade
## *Immediate Return!*

**Scenario : 50 sites connected via existing 128K links**

| | Monthly Charge* | Monthly Charge x 50 Sites | Additional Cost (2M - 128K link) | Cisco CDN (CDM4630 + 50xCE507) | Return of Investment |
|---|---|---|---|---|---|
| Domestic 128K link | US$910 | US$45K | - | - | - |
| Domestic 2M link | US$6K | US$300K | US$255K per month | US$443K (one time) | *< 2 mths* |
| International 128K link | US$7K | US$350K | - | - | - |
| International 2M link | US$51K | US$2.55M | US$2.2M per month | US$443K (one time) | *< 1 week* |

*Connection Charges Source –China Beijing Telecom Nov'00

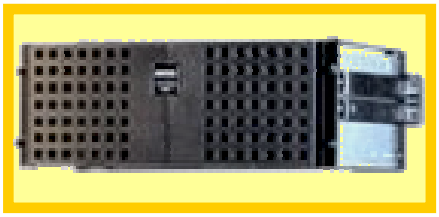



# Content Distribution Managers

CDM

**CDM 4600 Series:**

- **Management for CDN**
- **CDN policy & configuration database**
- **Content, customer registration & domain assignment**
- **CDN Network monitoring**
- **CDN Accounting interface**
- **Enterprise content registry**



**CDM 4650 / 4670**

**CDM 4630**




# CDM Product Portfolio

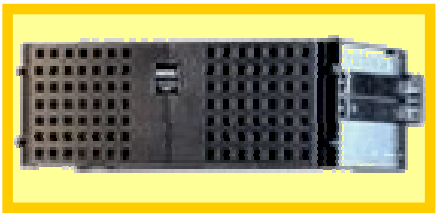
| Product Name | Content Distribution Manager 4630 | Content Distribution Manager 4650 | Content Distribution Manager 4670 |
|---|---|---|---|
| Part Number | CDM-4630 | CDM-4650 | CDM-4670 |
| CPU | 600 MHz PIII | 2 x 866 MHz Xeon | 2 x 866 MHz Xeon |
| Memory | 256 MB | 512 MB | 2 GB |
| Disk (Max) | 30 GB | 180 GB | 180 GB |
| Storage Array | No | Option | Option |
| NIC | 10/100 | 10/100 | 2 x 10/100/1000 |
| Recommended Configurations | Up to 100 CEs | Up to 1,000 CEs | 10,000 CEs |
| Orderability | $29,993 | $142,493 | $187,500 |

# Content Engines

CE

**Content Engine 7320:**

- Service Provider & Large Enterprise Deployment
- Caches Enabled Content
- Populated via Pull or Push
- Serves Requested Content



CE 7320

**Content Engine 500 Series:**

- Enterprise Deployment
- Transparent caching & content delivery software modules
- Static files, Real G2, MPEG 1 & 2 support

CE 507 / 507AV / 560 / 590





# Content Engine Product Portfolio

| | Low End Content Engine | Medium Content Engine | High End Content Engine | Huge Content Engine |
|---|---|---|---|---|
| Product Name | Content Engine 507 | Content Engine 560 | Content Engine 590 | Content Engine 7320 |
| Part Number | CE-507 | CE-560 | CE-590 | CE-7320 |
| CPU | 600 MHz PIII | 600 MHz PIII | 600 MHz PIII | 2 x 866 MHz Xeon |
| Memory | 256 MB | 512 MB | 1 GB | 2 GB |
| Performance | T1/E1 | 20Mbps | 45+Mbps | 155+Mbps |
| Internal Storage | 1 x 18 GB | 2 x 18 GB | 2 x 18 GB | 10 x 18 GB |
| Disk | 36 GB | 36 GB – 144 GB | 36 GB – 252 GB | 180 – 396 GB |
| Storage Array | No | Option | Option | Option |
| NIC | 2 x 10/100 | 2 x 10/100 | 2 x 10/100 | 2 x 10/100/1000<br>4 x 10/100 |
| Height/ Power | 1 RU/AC | 1 RU/AC | 1 RU/AC/DC | 7 RU/n+1(AC/DC) |
| Software | CDN or Cache | Cache | CDN or Cache | CDN or Cache |
| Pricing | $8,250 | $22,500 | $45,000 | $135,000 |

## Additional Materials

- http://www.cisco.com/go/cdn
- http://www.cisco.com/warp/public/cc/so/neso/ienesv/cxne/wyomg_an.htm
- http://www.cisco.com/warp/public/cc/so/neso/ienesv/cxne/prmda_an.htm