

# How the Cobb County School District GroupWise® System was Re-Architected

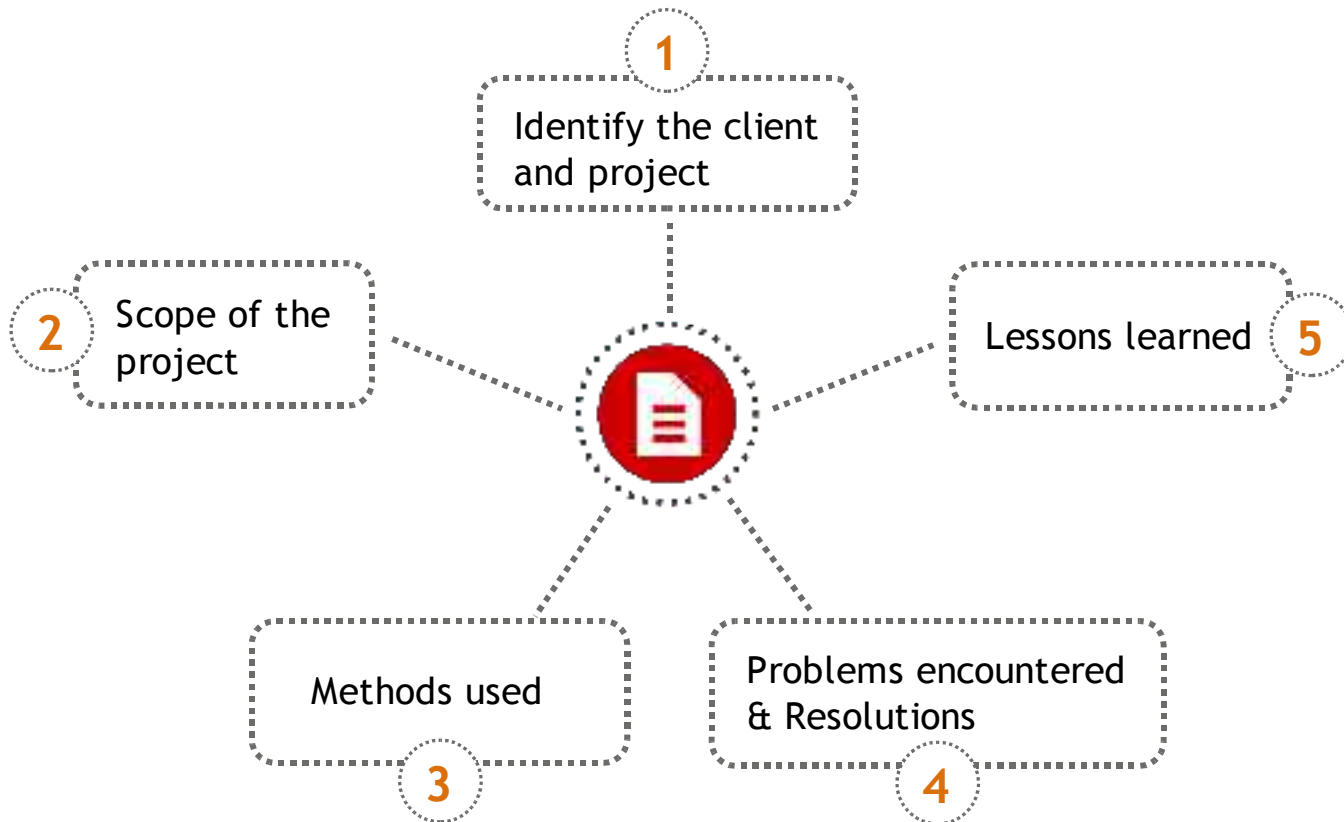
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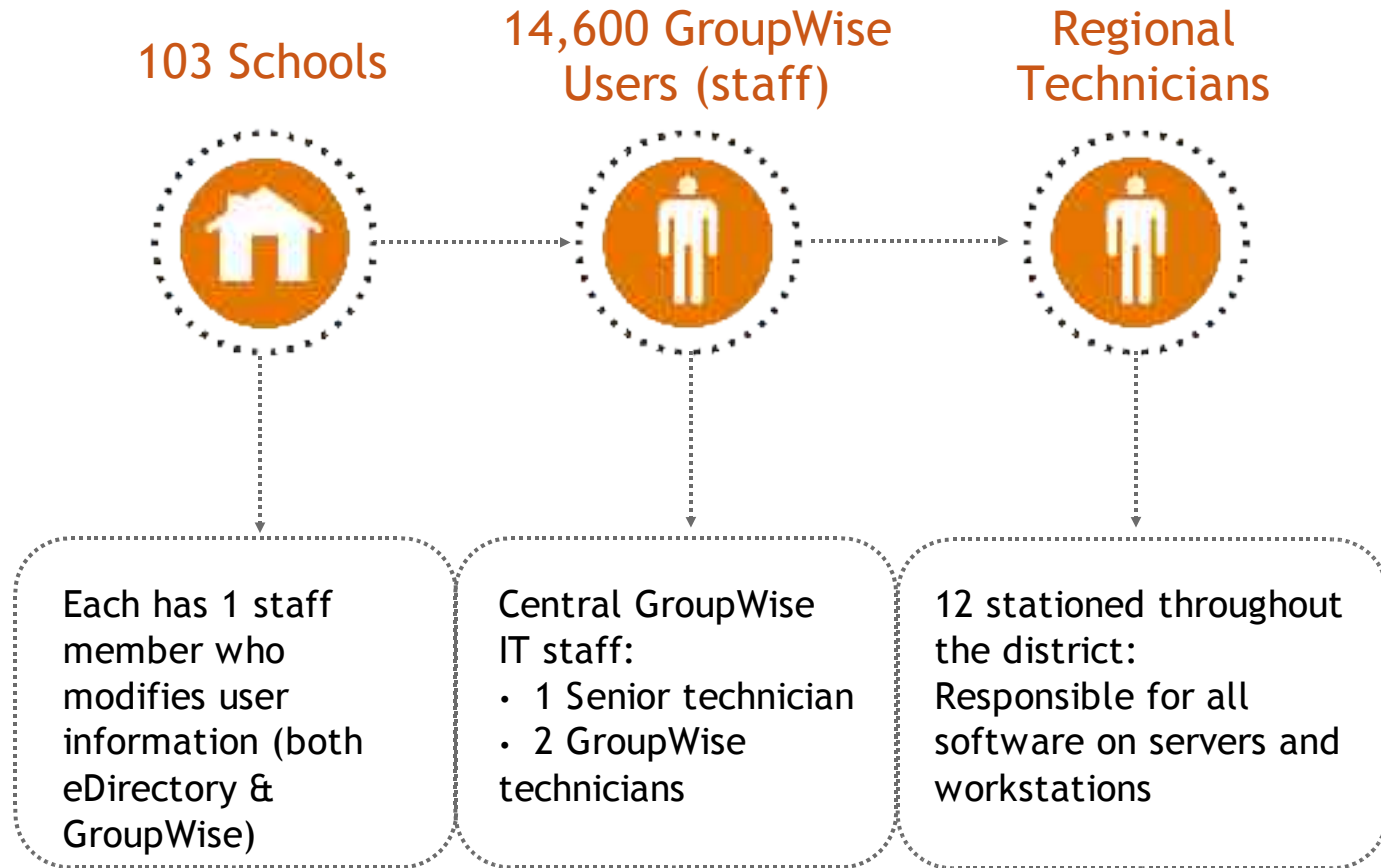
# Topics for Discussion



# The Client and Project



# Cobb County Public Schools





# Cobb County Public Schools

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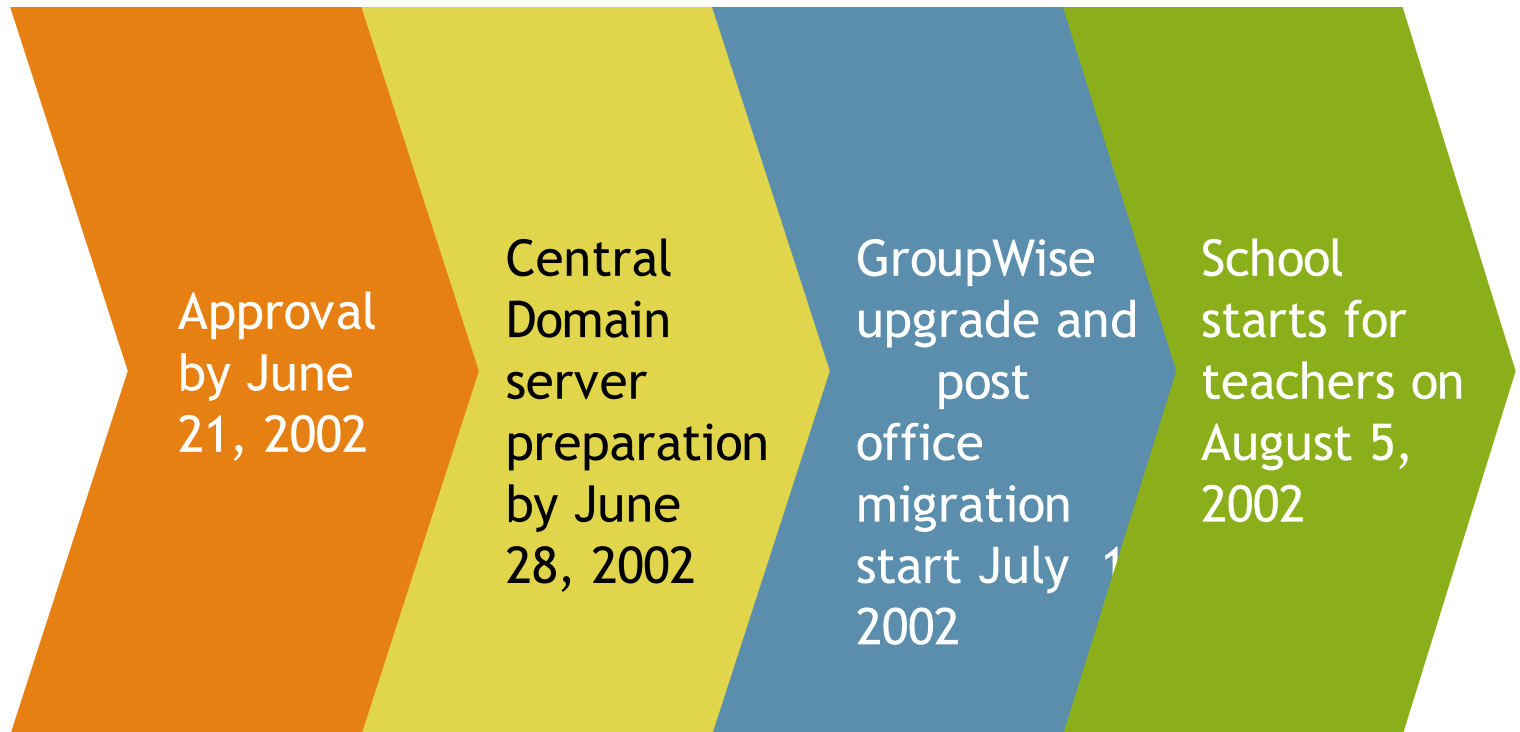
GroupWise system was constantly getting out of synchronization:

- Top down rebuilds needed monthly
- Novell support continually telling them the system needs to be restructured

Needed to be upgraded from GroupWise 5.5EP to 6



# Project Timing



# Scope of the Project



# GroupWise History

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GroupWise 5 installed in 1997

System designed by one company

Installed by 2nd company

Poorly documented

Poor regional technician training



## GroupWise History (cont)

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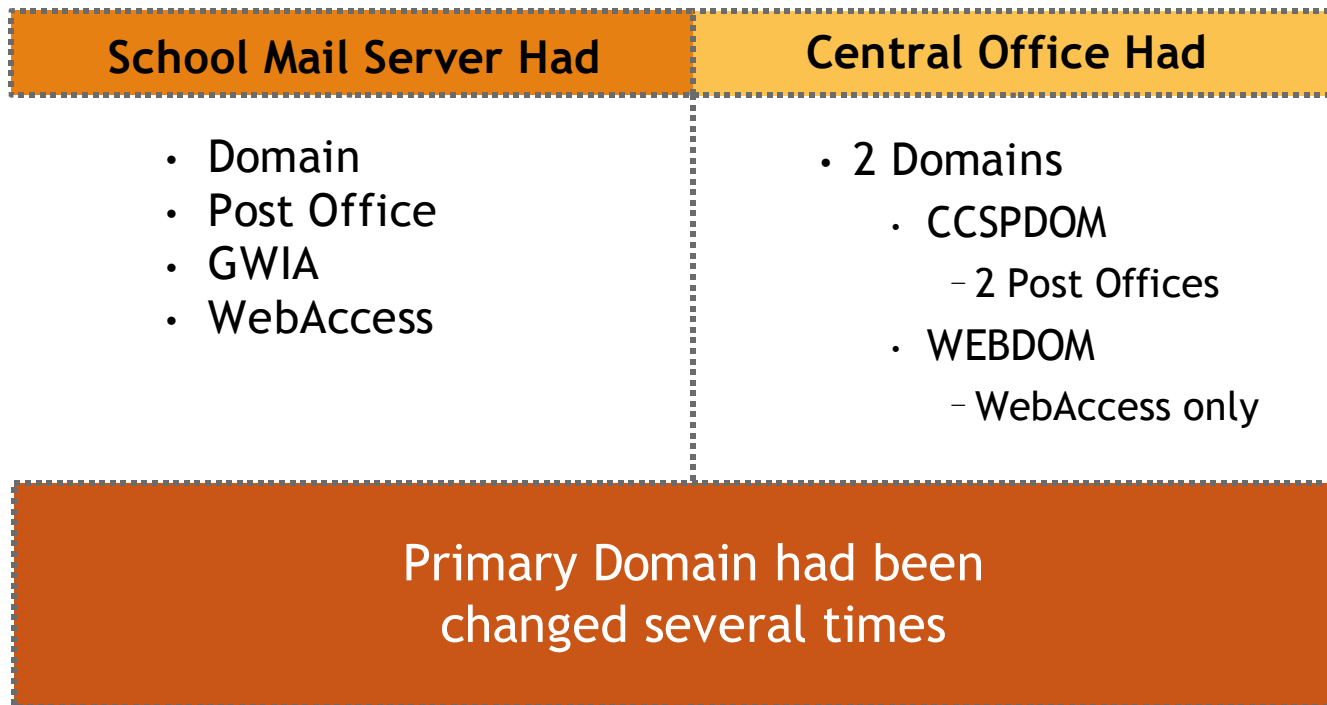
Installed with a Domain, Post Office, GWIA & WebAccess at each of 103 schools

- Concern about poor communication links to the central office
- Local administration for adds, modifies & deletes



# Situation at Start of Project

103 Schools each with 2 servers:





# eDirectory™ Replica Placement

## Master Replica at schools

- Not on Mail server
  - Admin staff claims ZENworks performs better



## Read/Write at central office

- Four Replica Servers





# Situation: Administrator Practices

## School Administrators

- Add eDirectory account and contact central GroupWise administrator to add user to Post Office
- Would delete eDirectory account without regard to GroupWise account

## Regional Technicians

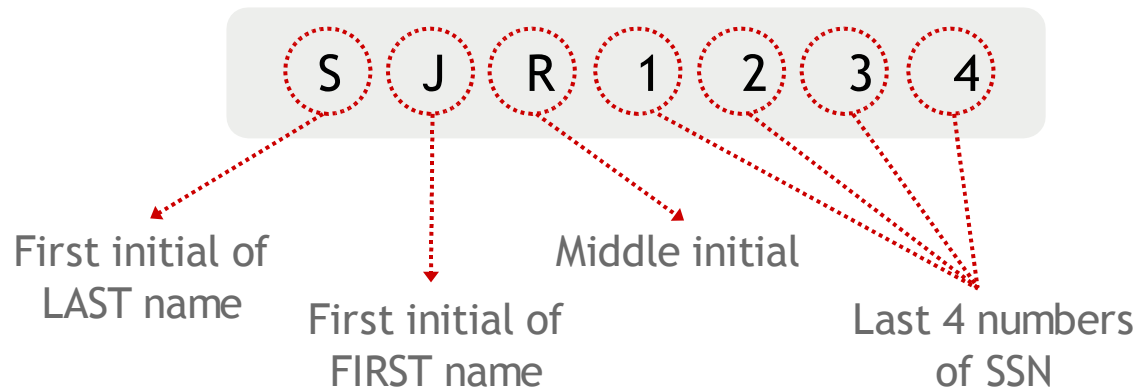
- Would bounce server rather than troubleshoot problem
- Would delete GroupWise account and re-create it when a problem occurred instead of performing mailbox maintenance



# Situation: Naming Conventions

## eDirectory User Object ID & GroupWise Account

E.g., SJR1234



### GroupWise Nickname

- Full name
- *Used as primary email address!*

# Domain, Post Office, & Gateway Placement



# GroupWise System Databases

Total of 207 databases

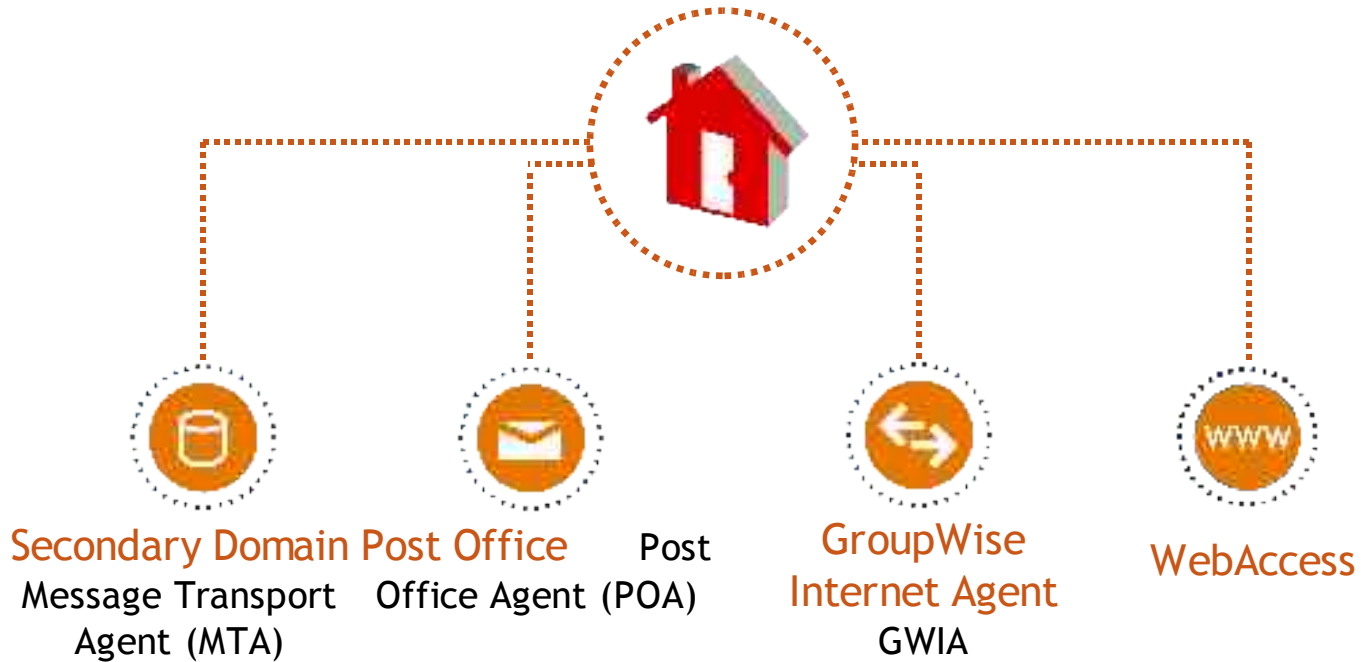


One for each  
Domain and  
Post Office

One for  
WebDom (No  
Post Office)



# Each School had:



# Physical Topographic Infrastructure



# Physical Topographic Infrastructure

Central office houses the topographic “hub”

- Each school is a “spoke”



*All WAN traffic goes through central office*



# Primary Domain – CCPSDOM



Located at central office



Intra-system traffic follows the topographic infrastructure



All Internet traffic goes through the CCPSDOM's GWIA



# Primary Domain Changes

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All domains and post offices **must** receive word about the reconfiguration prior to user moves.

User moves will “hang” until the domain the sending domain thinks is primary is informed about the move.



# Effect of Hub & Spoke Topology

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Every time a change is made, all databases must be updated

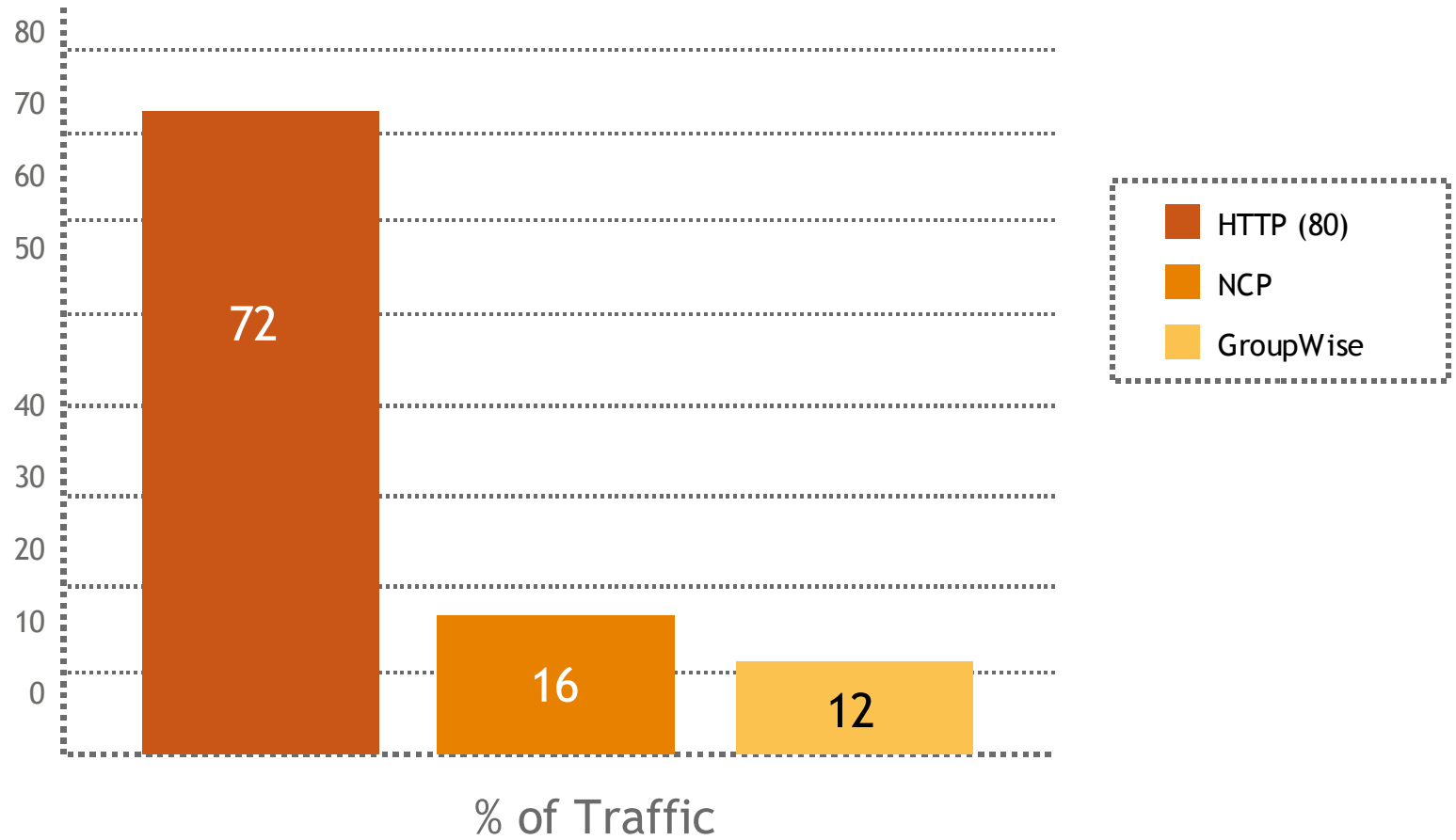
- Change made at a school was transmitted to the Primary (CCPSDOM) then out to all other schools
- This made CCPSDOM the single point of failure

## Internet traffic

- From school's GWIA through CCPSDOM's GWIA
- Plain text SMTP traffic (port 25)
  - 1,000 msg/hour incoming
  - 500 msg/hour outgoing



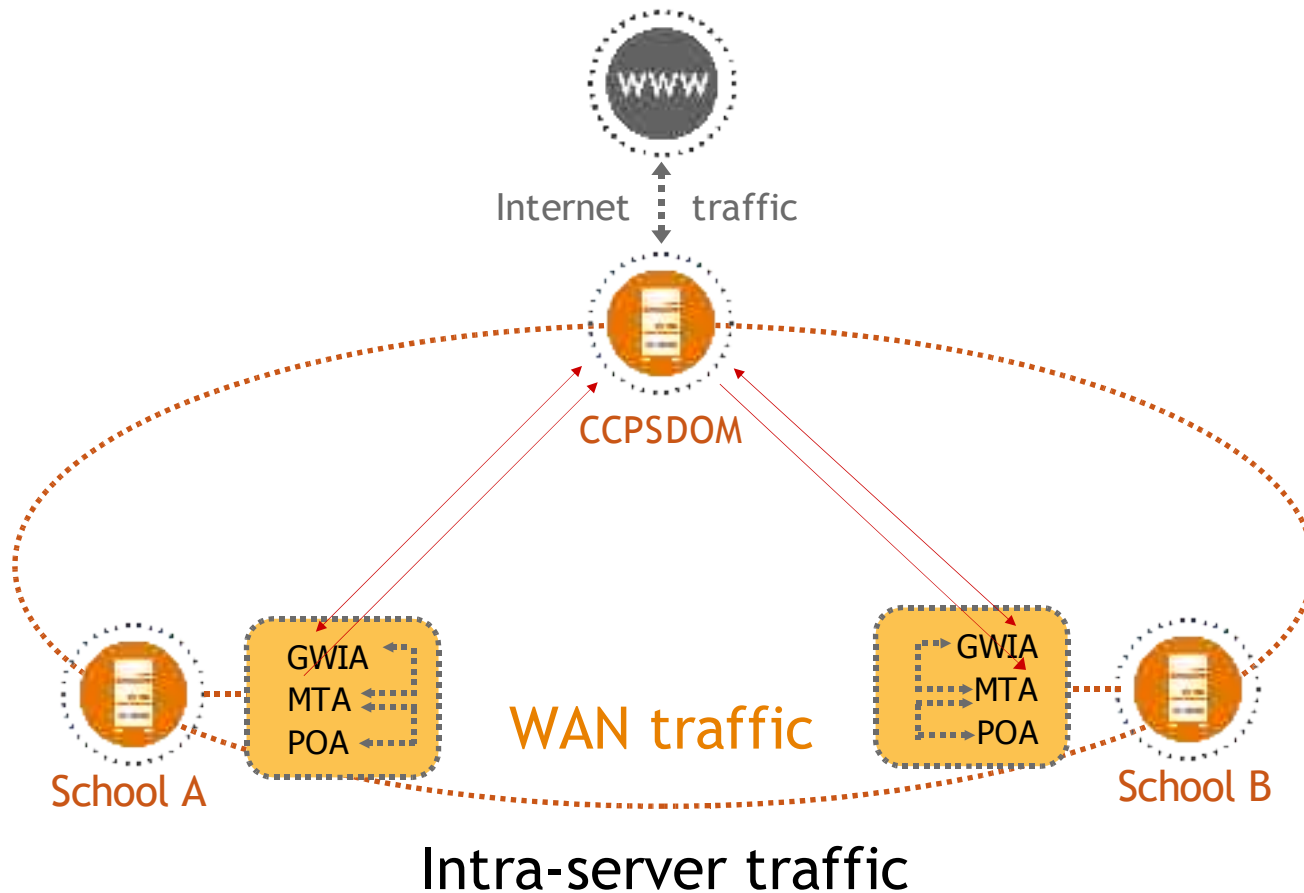
# WAN Traffic





# Existing Message Flow

## Inter-Post Office & Internet





# Recommendations

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- Reduce number and location of Domains
  - Regionalize or Centralize Domains
  - Eliminate school Domains
- Eliminate school GWIAs
  - Keeps Internet bound email encrypted on the WAN
- Create “Mesh” of Domains in central office LAN
  - Eliminate the single point of failure



# Architectural Redesign Goals

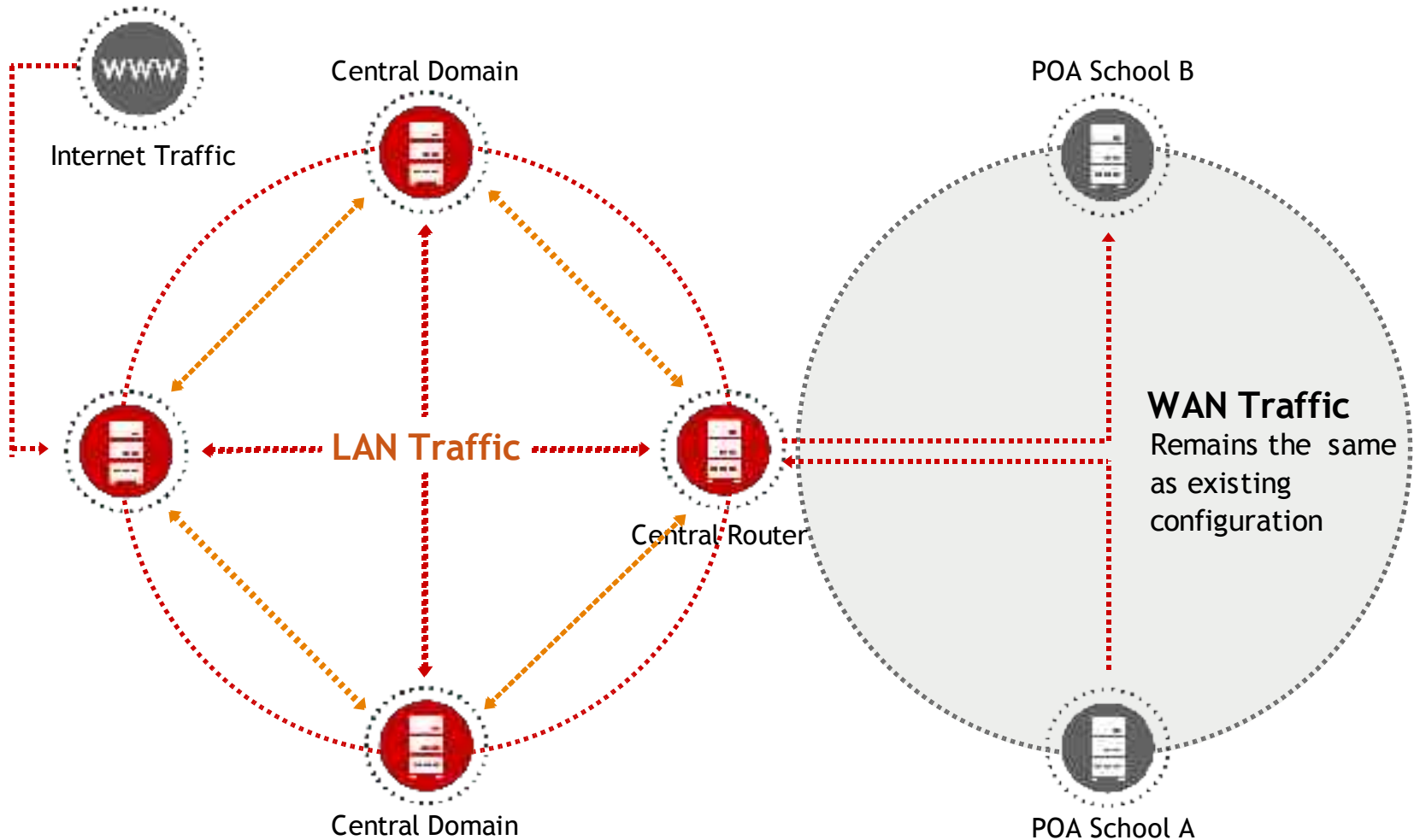
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- Follow Novell's recommended configuration
  - Reduce the number of GroupWise domains
    - 207 databases
  - Decrease need for top-down rebuilds
- Keep GroupWise in the current Tree
- No increase of WAN traffic
  - Current 12% of bandwidth
- No overburdening of school servers
- Eliminate single point of failure



# Architectural Solution

## Centralized Domains at Central Office



Better Distribution of Domains,  
Post Offices, Agents & Gateways



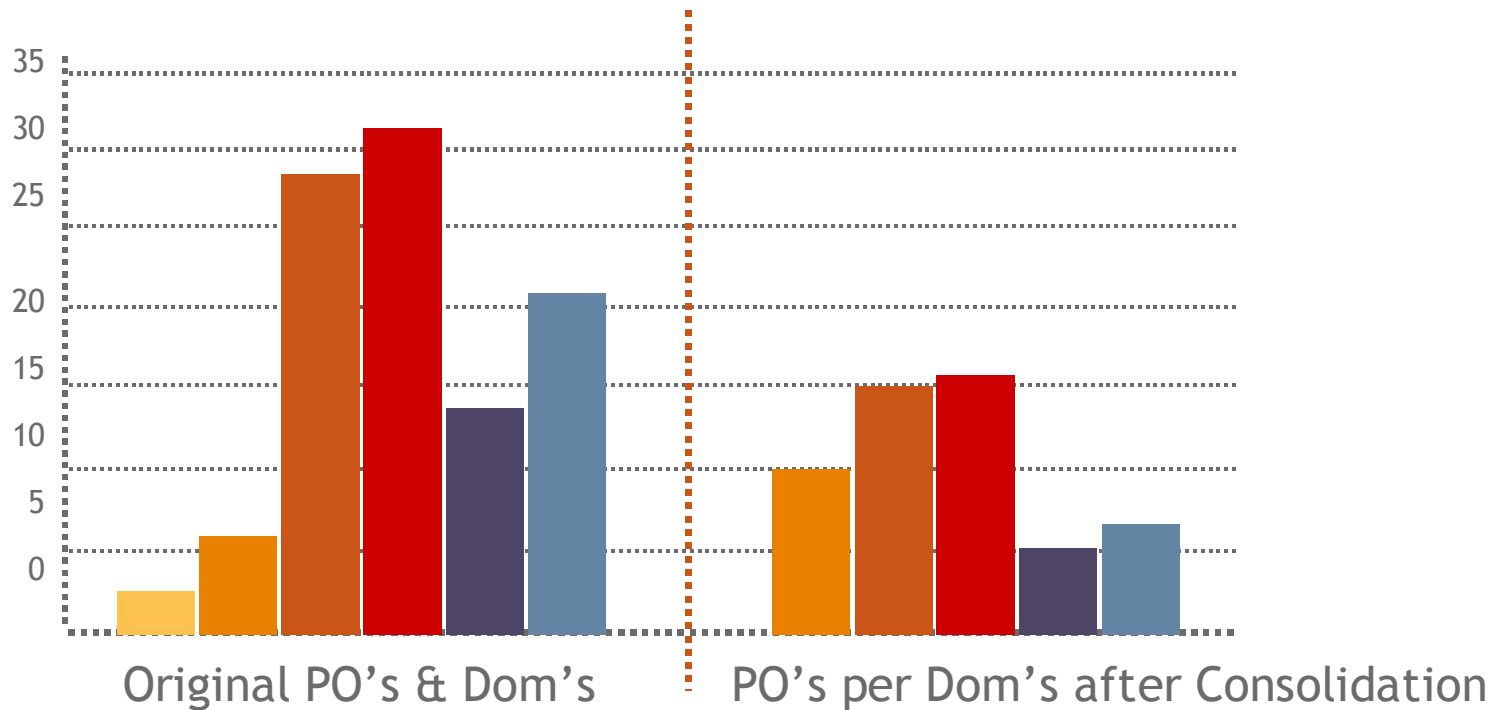
# Domain Architecture & Message Volume

Before Change			After Change		
Container	Messages*	MTAs & POAs	MTA	MSG/MTA	POA/MTA
AS	6,933	2			
CO	55,792	12	1	62,725	7
EA	99,473	58	2	24,868	15
EB	192,990	64	2	48,248	16
HS	213,674	28	2	53,418	7
MS	157,685	42	3	17,521	7
<b>Total</b>	<b>726,546</b>	<b>206</b>	<b>10</b>	<b>726,546</b>	<b>103</b>

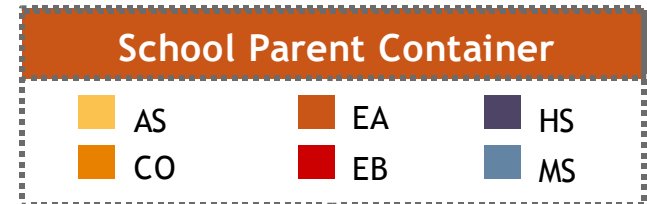
\*Estimated monthly message traffic between March and June 2002 gathered using IntelliReach's Periscope and Insight tools. BrainShare booth G150.



# Post Office to Domain Balance

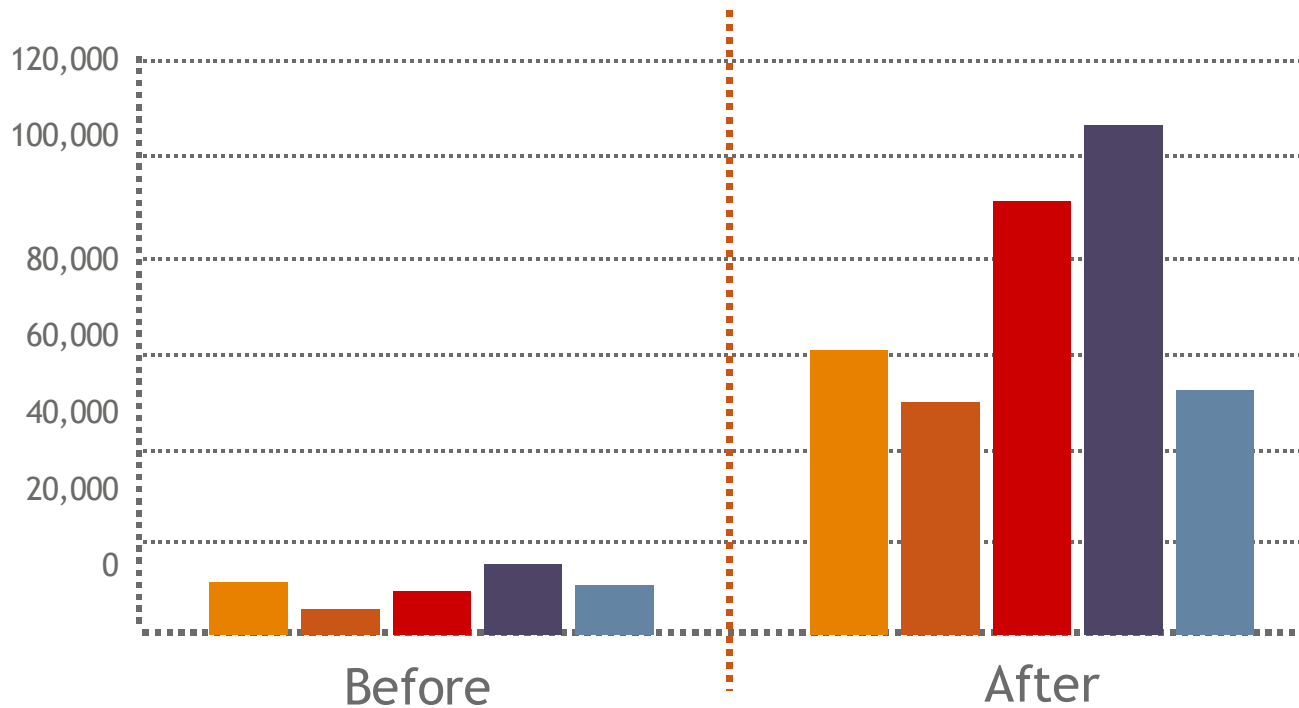


**GOAL: Balance Post Office to Domain ratio to avoid excessive MTA traffic**

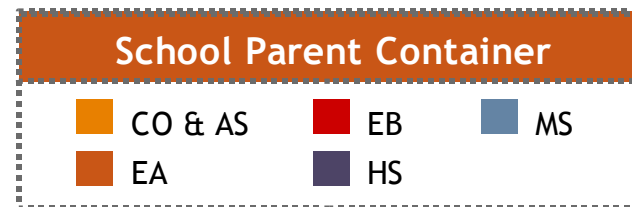




# Messages per MTA

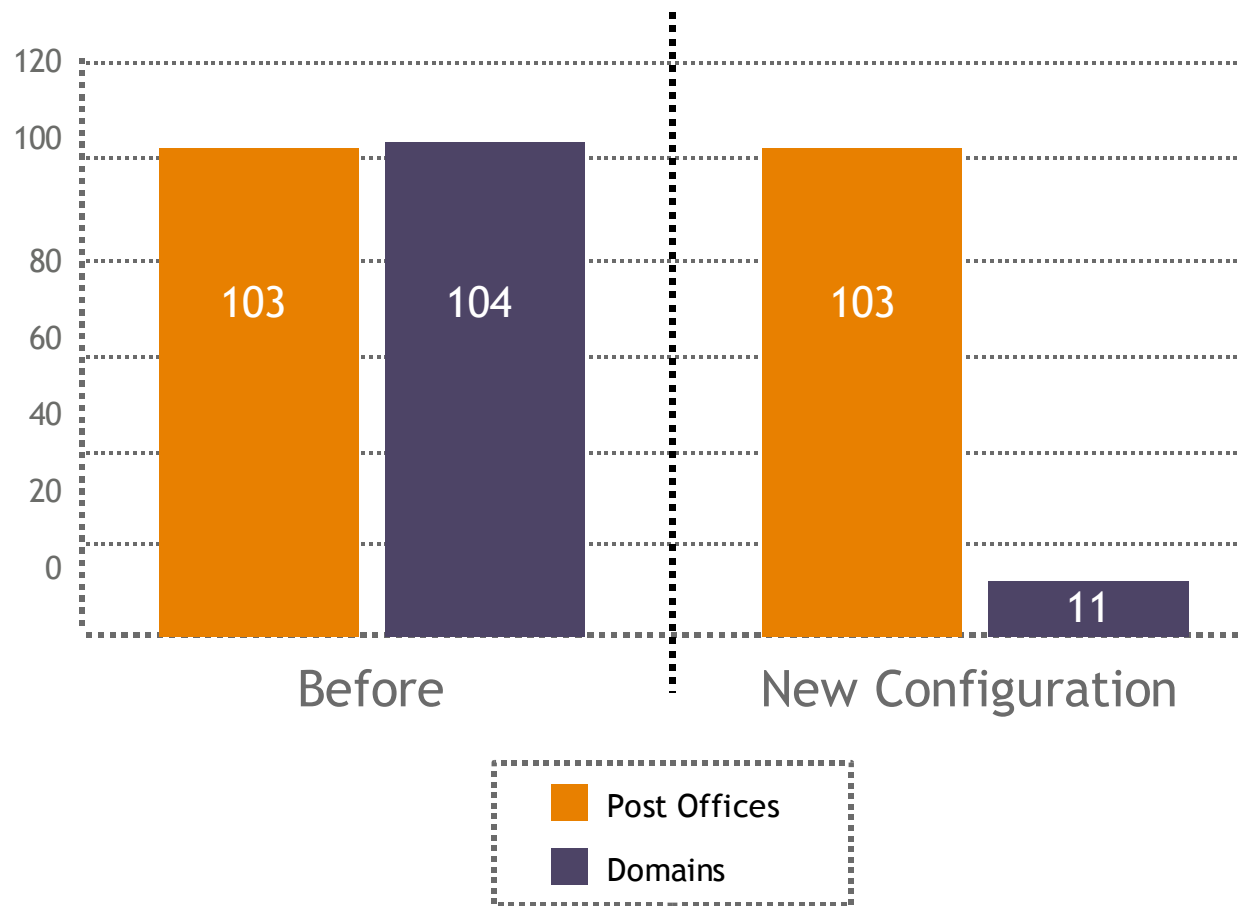


GOAL: Keep MTA traffic below 150,000 messages/month





# Reduction in Total Databases





# Benefits



## Benefits

- Reduces number of databases by 93
- No increase of replicas outside central office
- No increase in WAN message traffic
- Disables GWIA on school server
  - Reduces CPU utilization on School servers
  - Keeps Internet email encrypted on WAN
- Eliminates Single Point of Failure

# Methods Used



# Architectural Change Process

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- Update Primary domain to GroupWise 6
- Update school domains and post offices to GroupWise 6
  - Update all DC files and Software Directory Structures
- Create 10 new central domains (GroupWise 6)
- Create new post office at school (GroupWise 6)
  - Central domain as parent



# User Move & Facility Cleanup Process

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- Move users from existing school post office to new school post office
  - Move traffic goes POA to POA
    - Same server & volume
    - No WAN traffic
- Create user's Nickname at new post office
- Delete user's Nickname at old post office
- Delete school post offices, gateways & domains



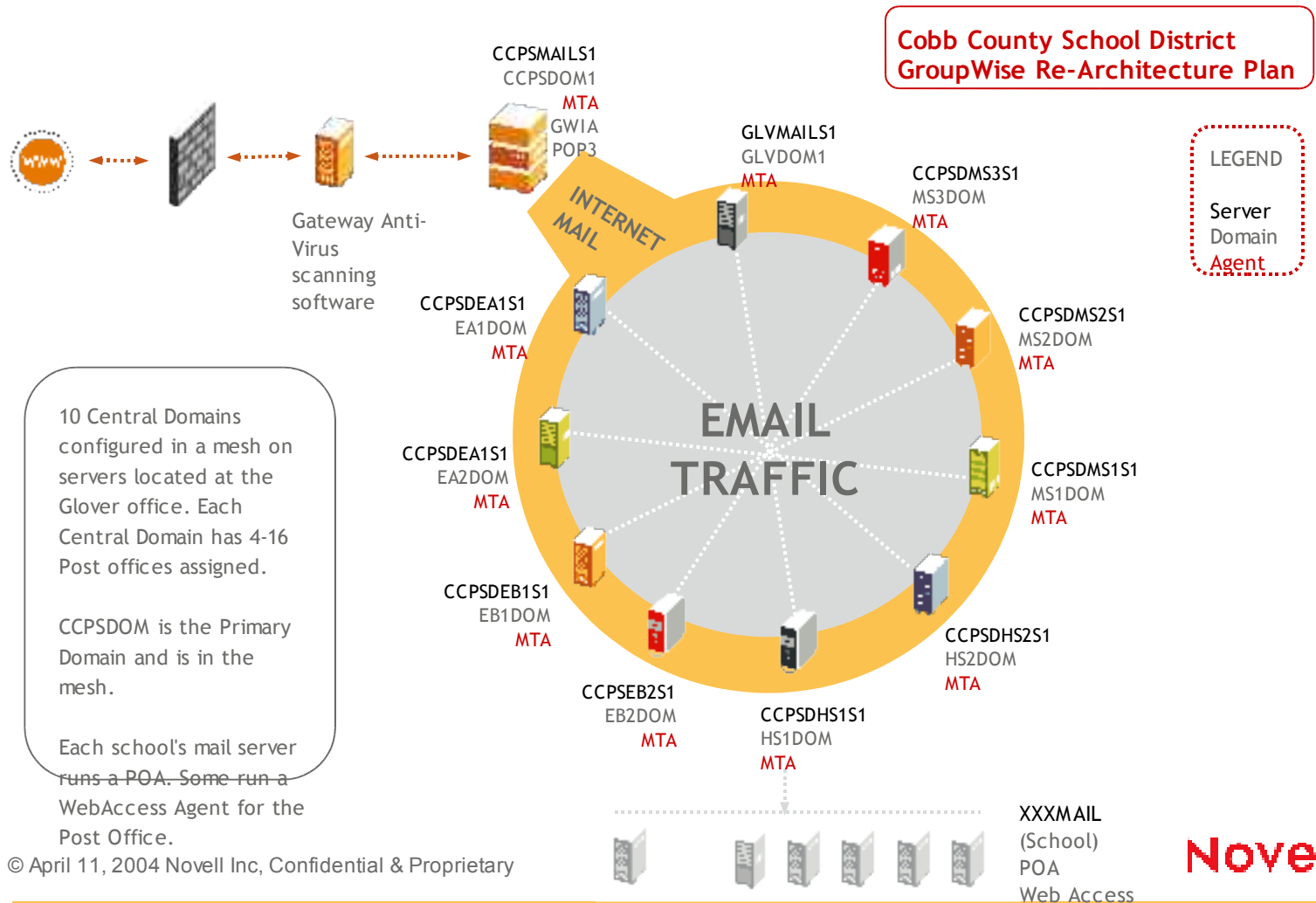
# GroupWise Client Update

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- 95% of all users use WebAccess
  - Update the WebAccess Agent will give new “look and feel” of update without client update
- Existing 5.5.4 client can access GroupWise 6 post office
  - Roll the GroupWise 6 client out “at leisure” (after the rush/confusion of school starting)



# Project Architecture and Completion





## New GWIA Distribution

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After project was completed

Installed a GWIA at each centralized domain

- Load balancing

# Problems Encountered & Resolutions



# Problems



- 1 Account synchronization
- 2 Inconsistent Dictionary (DC) Files
- 3 Attempted to “mesh” all domains
- 4 Poor communication links
- 5 Nicknames
- 6 User access during update & move



# Problem

## Account Synchronization

Synchronization problems forced monthly top-down rebuild

- Required 4 people, 3 days

Synchronization problems were worse when domains were meshed



Problem



Resolution



# Resolution

## Account Synchronization

Reduced number of databases to be updated

- Eliminate school Domains

Re-trained all technicians and school administrators



Problem



Resolution



# Problem

## Inconsistent Dictionary Files

Not all school post offices had the same NGWGUARD.DC dictionary file

Dictionary files are “template” database files

- Used during database creation and rebuild

*Success depends on consistent template among all post offices*



Problem



Resolution



# Resolution

## Inconsistent Dictionary Files

As part of the update process:

- Added the necessary DC files to each school's post office
- Copied Software Directory Structure files to each school

Recommendation:

- Keep all template (Dictionary DC) files up-to-date at each school



Problem



Resolution



# Problem

## Attempted to Mesh All Domains

Theory: *Putting all domains in a mesh configuration eliminates a "single point of failure"*

Doomed to failure

- All communications among schools go through the central office "hub"
- Poor communication links between central office and some schools



Problem



Resolution



# Resolution

## Mesh All Domains

Meshed newly-created centralized domains on LAN

Made all new school post offices “children” of centralized domains



Problem



Resolution



# Problem

## Poor Communication Links

### Unstable links between central office and schools

- Most often occur overnight
  - Suspected BellSouth of “reallocating” bandwidth
- 1<sup>st</sup> job each morning is to check “closed” domains and post offices and report downed links to appropriate administrator



Problem



Resolution



# Resolution

## Poor Communication Links

Reduced number of databases to be updated

Link upgrade to schools is in process (BellSouth)

- Eventually, all schools will be linked to central office via fiber



Problem



Resolution



# Problem

## Nicknames

RFP stated: ...14,600 users, each with an "Alias"

- Instead, each user had a Nickname

Nicknames are "owned" by the post office in which they are created

- They do NOT move with the user!



Problem



Resolution



# Resolution

## Nicknames

Applied “brute force” to get job done

- Added 200 “Out of Scope” person-hours to the job
- Worked evenings and weekends making up time
- Added 1 week to timetable

Policy change will eliminate problem in future

- GroupWise account will be user’s full name



Problem



Resolution



# Problem

## User Access During Update & Move

95 % of users access GroupWise via WebAccess

- Calls to the school to “stay out of GroupWise” went unheeded
  - Most teacher staff were home

*If a user accesses GroupWise while it’s being updated or moved, his/her account could be corrupted and that access will interrupt the move*



Problem



Resolution



# Resolution

## User Access During Update & Move

Changed the connection between the WebAccess Agent and the post office being worked on to “Direct Only”

- WebAccess Agent had no rights to post offices
- Prevented users from gaining access to their accounts



Problem



Resolution



# Problem



## Summary

Existing domain, post office, GWIA and WebAccess at each school

Problematic communication links

Incorrect administrative procedures

Mixed Dictionary file versions among schools

Nicknames instead of Alias



# Resolution



## Summary

Migrated all facilities to GroupWise 6

Added necessary Dictionary and Software Directory Structure files at each school

Recommended they keep all template (Dictionary DC) files at each school up-to-date



# Resolution



## Summary (cont)

### Reduced number and location of domains

- Meshed the 10 centralized domains
  - Primary domain also in the mesh
- Eliminated school domains

### Eliminated school GWIAs

- Keeps Internet-bound email encrypted on the WAN
- Added GWIA to each centralized domain for load balancing

# Lessons Learned



## Glitch & “Duh!” #1

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**Glitch:** Some new servers for centralized domains had identical Server IDs & IP addresses

- Server IDs & addresses propagated to routers
- Problem with RConsole and GroupWise when 2 servers and volumes have same name

**Resolutions:** Reset server IDs, IP addresses & routers



# Lesson Learned #1

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## Cause of the Glitch

- A client's staff member had too many simultaneous projects
- Neglected to document one server's settings before creating the second

Be sure the client's staff is as careful as you are when working on *YOUR* project



## Glitch & “Oops!” #2

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**Glitch:** RFP misquoted the condition of the system

- Stated “...14,000+ users, each with an Alias...”
  - Instead, each had a Nickname as his/her primary email address
- Caused 200 hours of “Out of Scope” work
  - Required extension of the deadline

**Resolution:** Brought in extra staff who worked evenings and weekends to meet new deadline



## Lesson Learned #2

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### Cause of the Glitch

- Writer of the RFP did not understand the difference between an Alias and a Nickname
- Naming convention is arcane

Verify the data in the RFP

Be sure the RFP has an allowance for “Out of Scope” work

- There will be some



## Glitch & “@\$%\*!” #3

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**Glitch:** Passwords were lost in user moves

- 95% of all users use WebAccess
  - WebAccess requires a password
  - Users could not get into GroupWise to change their passwords

**Resolution:** Used 3<sup>rd</sup> party software to reset all passwords



## Lesson Learned #3

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### Cause of the Glitch

- Older versions of GroupWise did not move password with user account
- Upgrading the agents and databases may not activate all the new functions
  - Known problem
  - GroupWise 6 fixes the problem

Be ready for the unknown

# Project Accomplishments



# Accomplishments



## GroupWise Version

- All components are at least at 6.0.1
- All DC files are current
- All schools have current SDS



## Domain/Post Office Arrangement

- Current system is as proposed
  - 10 central meshed domains
  - Post Office at each school



## "Out of Scope" work

- Nicknames were recreated for users
  - Extra 200 hours



## E-mail Retention

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The migration process retained 97.5% of all mail, address book and calendar items

- E-mail was moving up to a week after move command was given
- Administrators related their staff was “ecstatic” to get their address books migrated

*“Lost” e-mail and calendar items can be restored from the post office and backup domain with great effort*



# Project Summary

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