GLENBROOK HIGH SCHOOLS
District Technology Department

TO: Dr. Mike Riggle

FROM: Marcus Thimm

DATE: April 9, 2012

RE: DISCUSSION/ACTION: Disaster Recovery Initiative

Disaster Recovery Strategy - Information Only

The district is heavily vested in the regular and daily use of technology to support all teaching and learning as well as administrative and business functions throughout the district. We all know what impact technology system failures and service outages can have on an individual, a school or the entire district.

The district therefore seeks to reduce the impact of potential technology failures by eliminating the single points of failure in these various systems as well as plan for the restoration of services if an unforeseen event or disaster causes major system failures or service disruptions.

Loss of equipment due to fire, flood or theft, for example, would require equipment replacements, restoring of system configurations and network connectivity before any user data could be restored. This process can be rather time consuming and may well be unacceptable to sustain the organization's function.

The strategies addressing these risks are called Disaster Recovery (DR) Strategies. DR is the combination of resources (equipment and people), processes and procedures that are planned for and predetermined in response to various anticipated disaster scenarios or disruptions to the organization. Resources are typically set aside to accommodate such situations so that resources are available when needed and therefore shortening the outage.

Two key parameters are Recovery Point Objective (RPO) and Recovery Time Objective (RTO). The basic questions best exemplifying these two parameters are:

- How much data can I accept to loose during an outage when I have to start again with my last backup?
- How fast do I need this data restored so I can continue my work?

They reflect the organization's commitment or ability to how fast and how detailed the recovery process needs to be. It correlates with costs and resources. RPO and RTO will not need to be the same for all systems and services across the organization and allows to prioritize recovery efforts accordingly.

Internal Systems

The district is pursuing to eliminate single points of failure in our internal systems. This requires a level of redundancy for equipment with the corresponding costs of over-provisioning.

Server and storage equipment in the data center is specialized and expensive. Duplicating these systems for Disaster Recovery redundancy purposes is therefore very costly. This is a key area were a creative approach to DR will provide the greatest cost savings or even open up the ability to develop a DR strategy in the first place.

External Systems

During the last year we have increased collaboration with District 214. We identified

- Our shared vision for a Disaster Recovery solution,
- Compatibility of device platforms, operating systems and network services,
- Adequate geographical distance between the data centers, and
- Server and storage equipment refresh currently underway at both districts.

The key ingredient to our collaboration is a clear focus on the long range desired outcomes and our willingness to cooperate to achieve these goals. The benefits are joint purchasing power, standardization across systems and sharing of these resources. This sharing will allow for cost avoidance at each district as neither will have to buy significantly more equipment to support the other districts compute and storage needs fully in a Disaster Recovery situation.

Instead of each district investing into two data centers for it's individual DR needs, both districts connect to each other and share resources in the existing data centers that are slightly upgraded for added storage capacity. Both districts will invest in the data center connectivity between the districts for DR purposes, and simultaneously create more redundancy for Internet access, as the other district's Internet connections now become an available alternate route as well.

This collaboration will provide a comprehensive but affordable Disaster Recovery (DR) strategy by establishing a shared technology platform leveraging each other's data center resources for Disaster Recovery and regular off-site backup activities.

Network Considerations

Additional special network equipment will be needed to streamline and automate the network configurations for DR and failover of services to another data center to ensure internal and external users can access those recovered services. Both Districts have begun to research these solutions. The distance between the data centers is seen as an advantage in DR but it represents an obstacle as it affects the timely exchange/delivery of data packets between both data centers that impacts the way data and services can be replicated from one system to the other.

Dedicated fiber connectivity between both districts is needed to provide required access to each other's data center and Internet resources. We have priced out costs for the connection between the data centers and $9000 per district/per year will be an entry point to connect our data centers with dedicated fiber and start using DR capabilities.

Conclusion

Disaster Recovery is a complex problem. Connecting our separate districts to leverage cost savings requires thoughtful planning and commitment. While both districts aim for the best possible outcomes of a DR solution we will assume a phased approach to explore the needed technologies and configurations step by step. This will allow us to study the ideal configurations and fine-tune our setup and understand all associated costs.

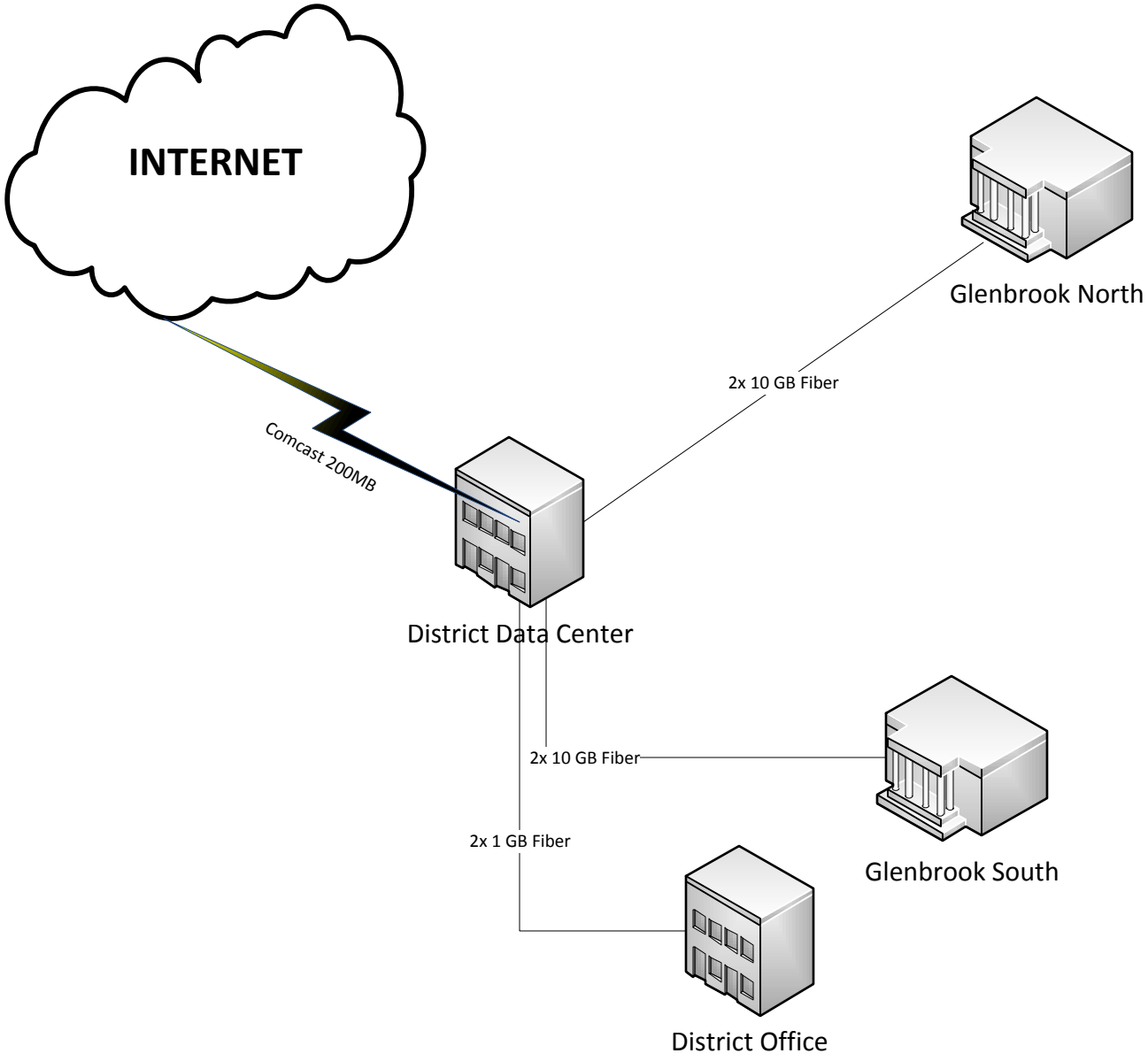
Furthermore, we will be able to model and showcase our DR abilities to others and create additional value-add opportunities in the future by establishing a cost sharing model allowing other organizations to join.

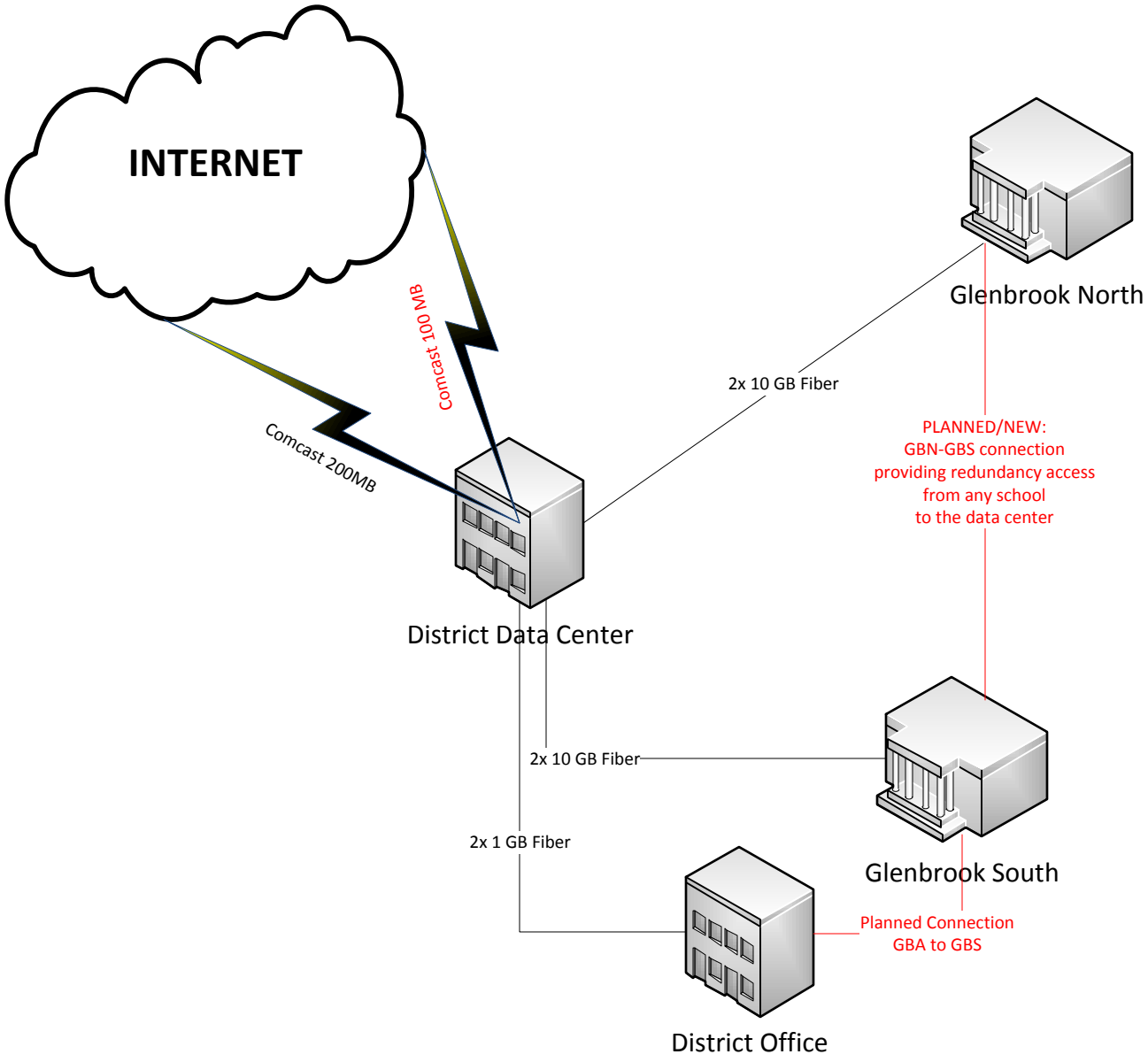
Three Phase Strategy

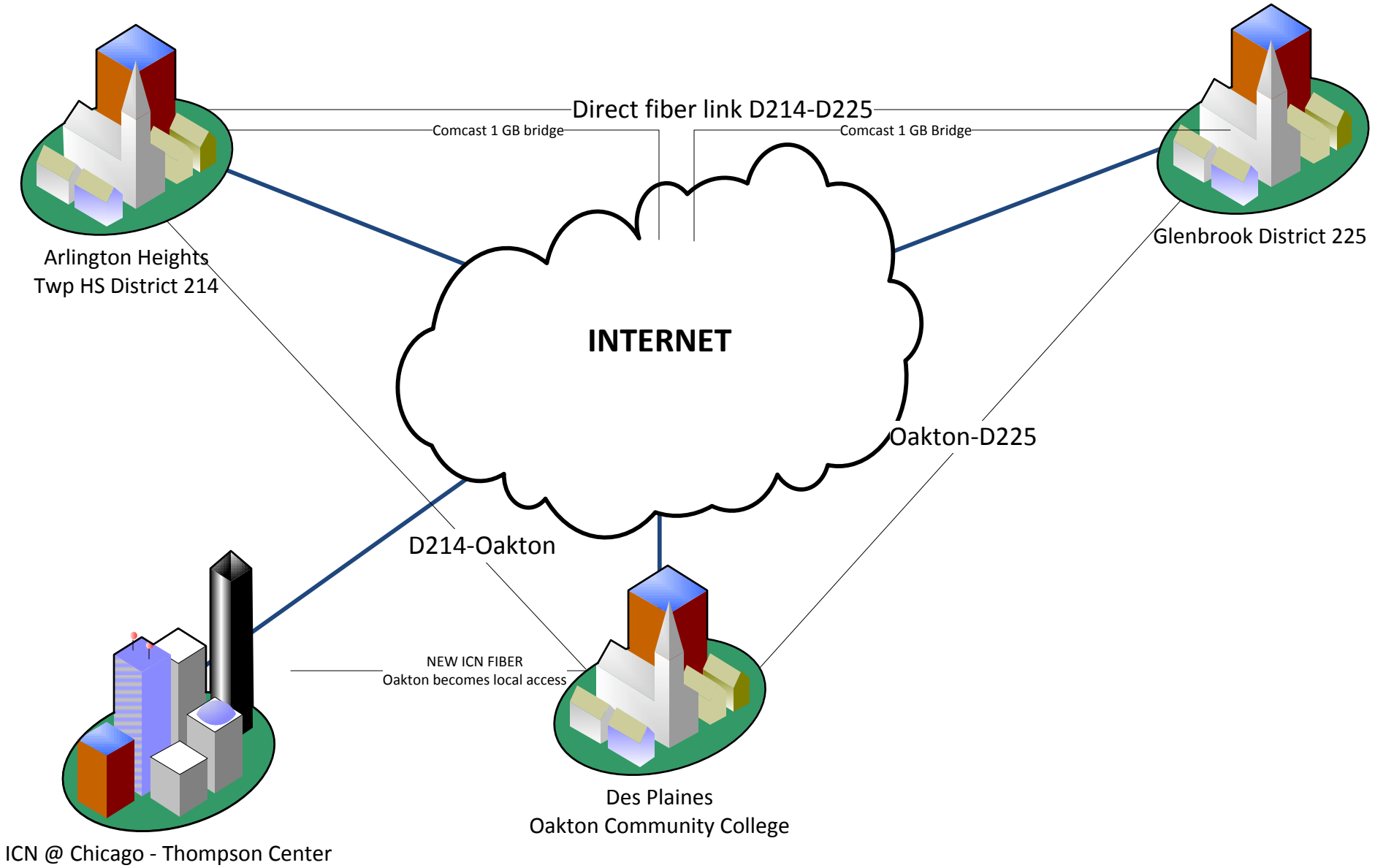
Phase One (FY 2012/2013):
- Upgrade Data Centers at D214 and D225
- Establish Connectivity between districts

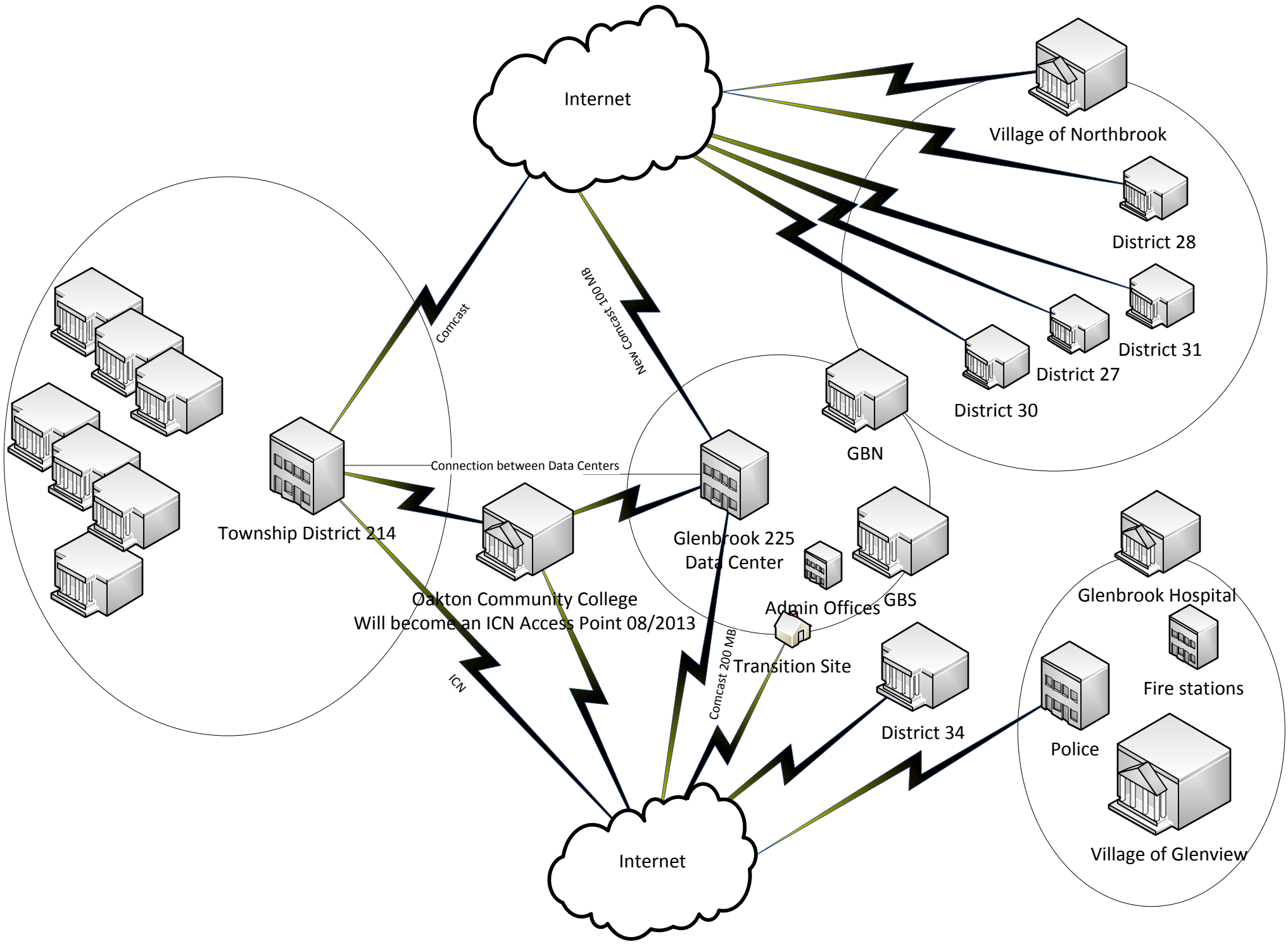
Phase Two (FY2013):
- Practice/test DR fail-over regularly
- Tune and optimize resources for DR sharing
- Advertise and showcase to sender districts and local municipalities and other HS districts

Phase Three:
- Provide services to third party organizations


INTERNET
Comcast 200MB
Glenbrook North
2x 10 GB Fiber
District Data Center
2x 10 GB Fiber
2x 1 GB Fiber
Glenbrook South
District Office


INTERNET
Comcast 100 MB
Comcast 200MB
Glenbrook North
2x 10 GB Fiber
PLANNED/NEW:
GBN-GBS connection
providing redundancy access
from any school
to the data center
District Data Center
2x 10 GB Fiber
2x 1 GB Fiber
Glenbrook South
Planned Connection
GBA to GBS
District Office


Direct fiber link D214-D225
Comcast 1 GB bridge
Comcast 1 GB Bridge
Arlington Heights
Twp HS District 214
INTERNET
Glenbrook District 225
Oakton-D225
D214-Oakton
NEW ICN FIBER
Oakton becomes local access
Des Plaines
Oakton Community College
ICN @ Chicago - Thompson Center


Internet
Village of Northbrook
District 28
District 31
District 27
District 30
Comcast
New Comcast 100 MB
GBN
Connection between Data Centers
Township District 214
Glenbrook 225
Data Center
Oakton Community College
Will become an ICN Access Point 08/2013
Admin Offices
GBS
Glenbrook Hospital
Fire stations
Police
Village of Glenview
Transition Site
Comcast 200 MB
ICN
District 34
Internet