BACKUP & DISASTER RECOVERY SOLUTIONS

BACKUP & DISASTER RECOVERY

A plan for when things don’t go to plan. Designing a strategy that works for you.

In today’s unstoppable global economy nothing is more critical than keeping your IT infrastructure available around the clock. But how can you manage increasing amounts of data distributed over multiple, disparate systems to meet your data residency and retention compliance obligations? Or bring your critical data and applications back online quickly in the event of a disaster—in a way that cuts through complexity, and internal resource and budget constraints?

One way is through our comprehensive suite of Backup and Disaster Recovery (DR) solutions, which release your IT people, energy and resources from administrating daily backup jobs to focusing on innovation and growth. We believe an effective backup and DR strategy can only be achieved when your business goals are carefully aligned with automated processes, run books, robust offsite infrastructure and an experienced team that can help rapidly recover your data should disaster strike.

With our backup and disaster recovery solutions you are in control, having the opportunity to design a solution that can be tailored to meet your data retention, recovery point and time objectives, and keep your critical applications running and safe from data loss.

Our suite of backup and disaster recovery options allows you to construct a solution to meet your specific requirements, and optimize recovery at either the file, server, virtual machine or application level.

Our backup and recovery solutions encompass:

- Disk backup
- Offsite tape archival
- Recovery services for:
  - Files
  - Bare-metal servers
  - Databases
  - Virtual machines
  - Operating systems
  - Applications
- Data restoration
- Data lifecycle management and disposal
- Tailored disaster recovery replication solutions

We believe that one size fits no one. We will work closely with you to understand your business goals, manage to your budget constraints but deliver a complete solution based on proven, reliable platforms. All of which gives you unstoppable IT for the unstoppable business era.
TECHNICAL SPECIFICATIONS

Backup Frequency, Retention Policy and Media Selection

We provide you with flexible backup and replication policies that can be customized to meet your requirements for data backup and restoration requirements.

Backup Frequency refers to how often a backup is made from the source data. The more frequently the source data changes, the more frequently a backup should be made, allowing for more granular recovery of files and data.

Backup Retention refers to how long backups of a specific Backup Frequency are available for recovery. In order to manage the efficiency of backup resources, the higher the frequency of backup, the shorter the retention period.

Backup Media refers to how the backup data is stored. We provide two storage options, hard drive media (protected storage), and tape media (Tape Archival). Onsite hard drive provides the most efficient solution in terms of meeting high frequency and rapid recovery time objectives, while offsite tape archival provides a more cost-effective solution for long term data retention, but at the expense of backup frequency.

Replication is a business continuity and disaster recovery method to help protect mission critical servers, virtual machines and applications from both hardware and software failures. The process of replication ensures that every change that is made to a primary environment is replicated to a secondary environment. This solution is ideal if the primary environment suffers a major outage or if a server or virtual machine goes down, as you can failover to its replica in a few minutes, thus reducing down time.

Replication differs from backup strategies in that if a file is corrupt/damaged or deleted the change will replicate to the secondary site making it impossible to regain.

Replication solutions may be combined with backup solutions which enable you to replicate an environment and then backup data from the secondary site. By backing up multiple versions of the data, you are able to restore ‘back’ to a version of the file before it was corrupted/deleted.

Our recommended frequency, retention and media policies are outlined below:

<table>
<thead>
<tr>
<th>Backup Frequency</th>
<th>Backup Retention</th>
<th>Backup Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>7 Days</td>
<td>Onsite hard drive</td>
</tr>
<tr>
<td>Weekly</td>
<td>4 Weeks</td>
<td>Onsite hard drive</td>
</tr>
<tr>
<td>Monthly</td>
<td>Customer term</td>
<td>Offsite tape archive</td>
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</tbody>
</table>

Backup and Disaster Recovery Applications

We use a variety of different backup and replication platforms to provide you with recovery options for the following data and applications, including Symantec, Veeam, EMC, Tivoli, Christie and R1 Soft.

- File, Print and Web Servers
- Virtual Machine Backup
- Virtual Machine Replication
- Microsoft Active Directory
- Microsoft Exchange
- Microsoft SharePoint
- Microsoft SQL Server
- MySQL Database
- Oracle Database
Protected Storage

Protected Storage refers to the hard drive capacity available in support of your backup and disaster recovery solution. The protected storage must be sufficiently sized to meet your backup frequency and retention policies but also any forecasted growth in the size of the source data.

We take the following factors into account when calculating Protected Storage requirements:

- **Source Data:** The total size of the data that requires backup
- **Source Data Growth Rate:** The increase in size of the Source Data over the term of the contract
- **Source Data Change Rate:** The frequency at which data is changing within the Source Data
- **Differential or Full Backup:** A differential backup copies only data that is new or changed from the previous backup. A Full Backup always creates a duplicate of the source data
- **Backup Frequency and Retention:** Determines the number of backups that will be maintained on the Protected Storage
- **Geo Diversity:** Refers to the physical location of the protected storage in relation to the source data

Tape Archival

Tape Archival refers to the backup of your data onto tape medium, transport of the tapes in a secure climate controlled vehicle, and the long term storage of tapes within a secure, climate controlled vault. In the support of restoral activities, the service includes the transport of tapes within a secure, climate controlled vehicle, back to our facilities.

We take the following factors into account when calculating Tape Archival requirements:

- **Source Data:** The total size of the data that requires backup
- **Source Data Growth Rate:** The increase in size of the source data over the term of the contract
- **Backup Frequency per Month:** Determines the number of backups that will be made to tape in a month. Tapes will be securely transported from our appliances to the tape vault once per month

**NOTE:** We do not recycle or reuse cycle tapes over the course of a customer contract.

All tapes are archived offsite for the duration of the contract.

RESTORATION PROCESS

We will commence the restoration process once you have identified the target location for where you would like us to restore your data to.

Examples include target restoration locations such as the following:

- Testing/staging server for manipulation instead of the original server the data is from
- Production server or folder instead of the original server; or
- The original server/storage location

Restoration of your data stored onsite will begin within 60 minutes of us receiving a request. Restoration of data stored offsite will begin within 60 minutes of us receiving the media from the offsite storage location.

**NOTE:** The restoration process for data from an Exchange environment takes place in two stages—first from tape to disk and then from disk to the target.

**NOTE:** The customer is responsible for specifying the restoration target and ensuring capacity is available to restoration and mount the data.
DISASTER RECOVERY TEST RUN

For tailored disaster recovery solutions, we will work closely with you to complete a 12-hour DR testing simulation each year to help and ensure that your solution remains effective and compliant with your requirements. Upon your request for DR testing, an agreed upon timeslot will be scheduled, in addition to the creation of DR run books to ensure all parties are clear on roles and responsibilities during the test period.

DATA LIFE CYCLE MANAGEMENT AND DISPOSAL

We support the following data disposal options:

- Securely erase any hard drive based backup data housed within our data centers
- Secure transfer or disposal of Tape Medium including the following options:
  - i. Deliver backup tapes to the customer’s premises via commercial courier (additional costs may apply)
  - ii. Secure disposal of tape via commercial shredding service
  - iii. Deliver backup tapes to the customer’s premises via secure carrier (additional costs may apply)
  - iv. Secure tape destruction with certificate of destruction (additional costs may apply)

Backup Storage Area Network (SAN) Maintenance

In the event of a maintenance activity to the storage appliance your data may need to be migrated. We will notify customers in writing, in advance, of any activity to inform them that migration will be required based on a mutually agreeable maintenance window.

Offline Database Backup

If you have requested that your database backups be completed offline, then the database will need to be stopped before the backup job is started. During the backup there will be no access to the database by any user or application. If you wish to provide us with adequate access rights and subject to the software capabilities, we can ensure that the database is stopped before a backup is started and then started once the backup is complete.

Online Database Backup

This option enhances database availability by allowing backups while the database is still active (online). This option takes advantage of facilities native to Data Base Management Systems (DBMS). The database is running and accessible during the backup. Because of this, however, some performance degradation should be expected. In order to perform the online database backup, the database Application Program Interface (API) must be activated. In addition, the database extension software requires scripts to specify which databases and components to back up. We recommend that a full backup be performed after any database structure change.

Database Modes

Customers must set their databases to archiving (or full) mode to take full advantage of our backup services. With the database in this mode, we can perform incremental backups and can provide shorter Recovery Time Objectives (RTO). If a database is set to non-archive (or simple) mode, then incremental backup jobs cannot be done and only full backups can be run, in which case the Recovery Point Objective (RPO) will be 24 hours.
### Operational Roles and Responsibilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Our Responsibility</th>
<th>Customer Responsibility</th>
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<tbody>
<tr>
<td>Specification of Backup Files and Applications</td>
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<tr>
<td>Specification of Backup Frequency and Retention Policies</td>
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<tr>
<td>Provide administrative access to compute resources requiring Backup Agent installation</td>
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<tr>
<td>Installation, configuration, and maintenance of Backup Agents per customer backup policy</td>
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<tr>
<td>Configuration and maintenance of Backup Servers and supporting infrastructure.</td>
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<td>Notification of Backup failures</td>
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<tr>
<td>Monitoring of Protected Storage usage and notification to the customer when Protected Storage is exhausted</td>
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<tr>
<td>Transport, and Archival of Tape Media within a secure, climate controlled environment</td>
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<tr>
<td>Initiation of a restoration request, including information scope, date, and data destination</td>
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<tr>
<td>Restoration of backup based on customer requests</td>
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<tr>
<td>NOTE: Some backup solutions allow the customer to manage their own restoral process</td>
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<tr>
<td>Secure deletion and destruction or transfer of backup data at the end of the Term or at the customer requests</td>
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</table>
ABOUT COGECO PEER1
Cogeco Peer 1 is a wholly-owned subsidiary of Cogeco Communications Inc. (TSX:CCA) and is a global provider of essential business-to-business products and services, such as colocation, network connectivity, hosting, cloud and managed services that allow customers across Canada, Mexico, the United States and Western Europe to focus on their core business. With 16 data centers, extensive FastFiber Network® and more than 50 points of presence in North America and Europe combined, Cogeco Peer 1 is a trusted partner to businesses small, medium and large, providing the ability to access, move, manage and store mission-critical data worldwide, backed by superior customer support.