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# Release 16.2 and Roadmap 2017

# Agenda

1. What's new in Bareos 16.2
2. In depth: Always Incremental Backup Scheme
3. What's on the roadmap for 2017?

# What's new in Bareos 16.2

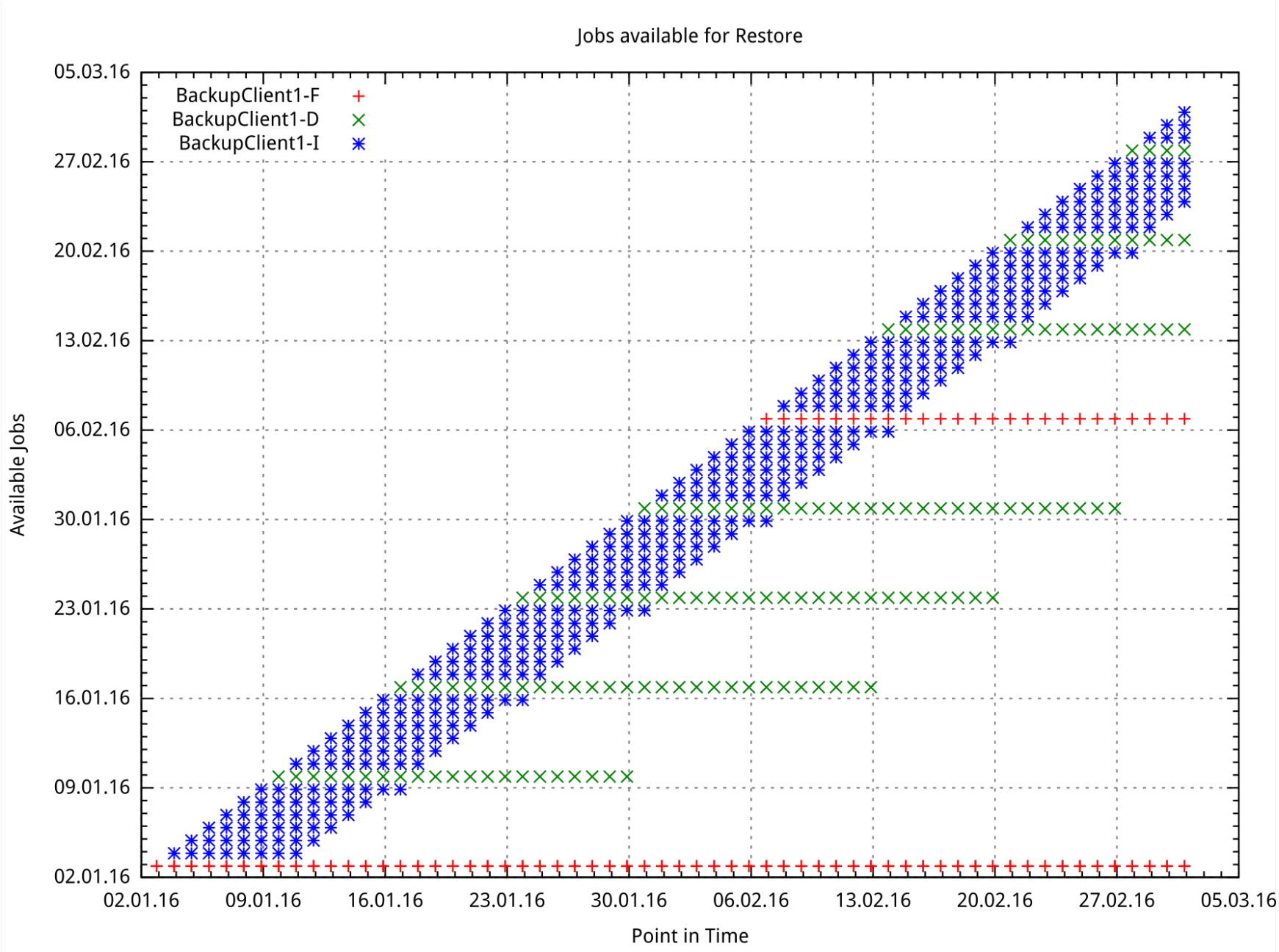
1. Always Incremental Backup Scheme
2. Client initiated connection (see dedicated presentation)
3. Enhanced ACLs: multitenancy
4. Performance Enhancements
5. News about the Web UI
6. NDMP Enhancements
7. New subdirectory configuration scheme
8. Configuration API: First steps
9. Plugins: Incremental backup und point-in-time recovery for MySQL

# In depth: Always Incremental Backup Scheme

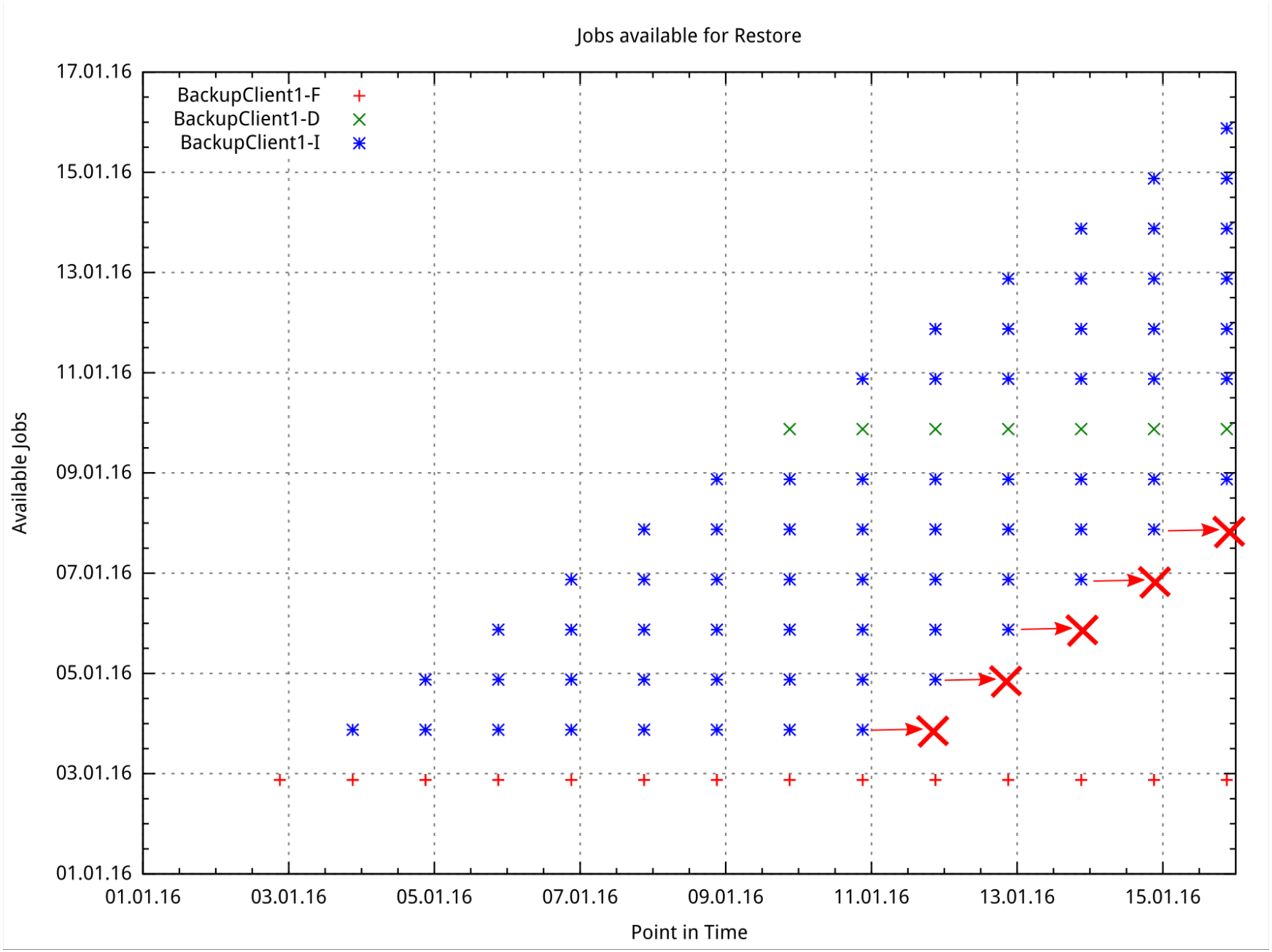
# Conventional backup scheme

1. daily incremental backups kept for one week
2. weekly differential backups kept for three weeks
3. monthly full backups kept for half year

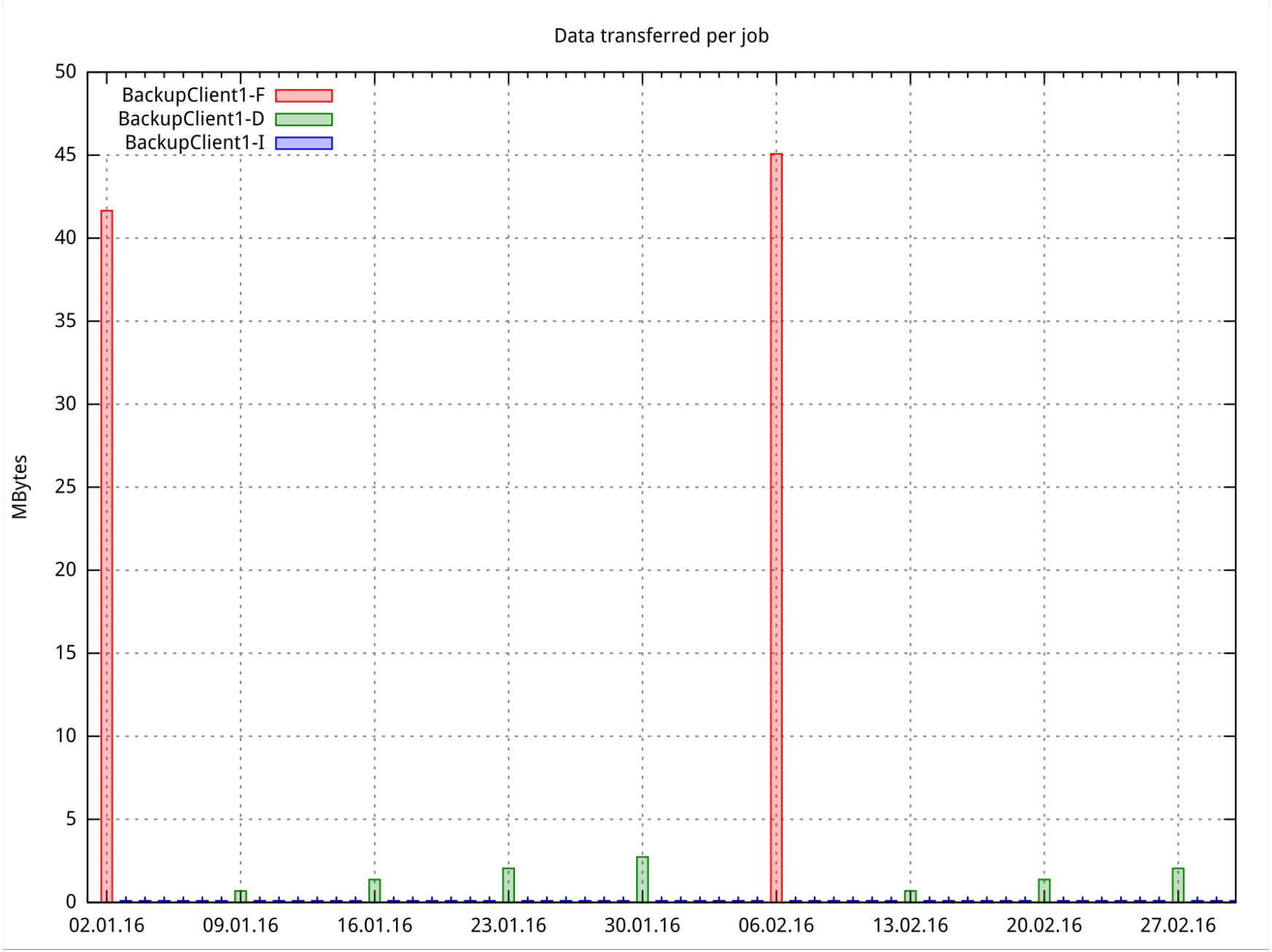
# Job availability for conventional backup scheme



# Job history loss for conventional backup scheme



# Data being moved in conventional backup scheme



# Problems with conventional backup scheme

1. Full data is copied over the network in regular intervals
2. Identical Data is copied from client multiple times
3. Job history loss caused by retention expiry

# always incremental backup scheme

- Basic concept
  - Only changes are copied from the clients - always incremental
  - Existing data from the client is consolidated with the new incremental information (keep history)
  - The consolidation happens without client interaction
  - Minimized number of incrementals is kept to have a defined change history

# Two main tasks:

1. Incremental backup job is run every night during the backup window
2. Consolidation job consolidates during the day

# How to configure always incremental

## Backup Job

```
Job {
    Name = BackupClient1
    ...
    Accurate = yes
    Always Incremental = yes
    Always Incremental Job Retention = 7 days
}
```

## Consolidation Job

```
Job {
  Name = "Consolidate"
  Type = Consolidate
}
```

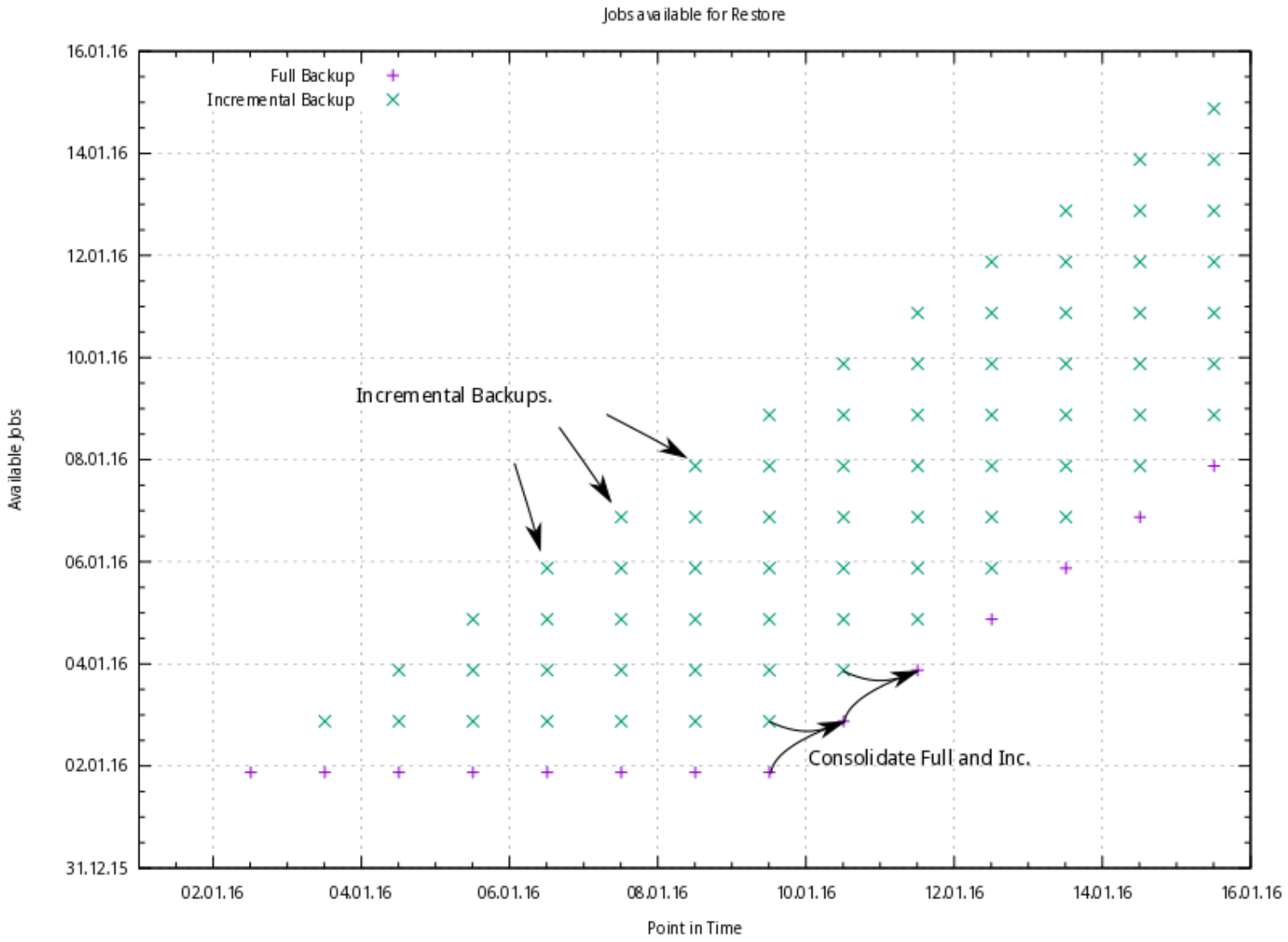
# The Backup Job

- runs an incremental backup during the backup window
- *Always Incremental* directives configure behaviour
- *accurate* Backup to notice file deletion

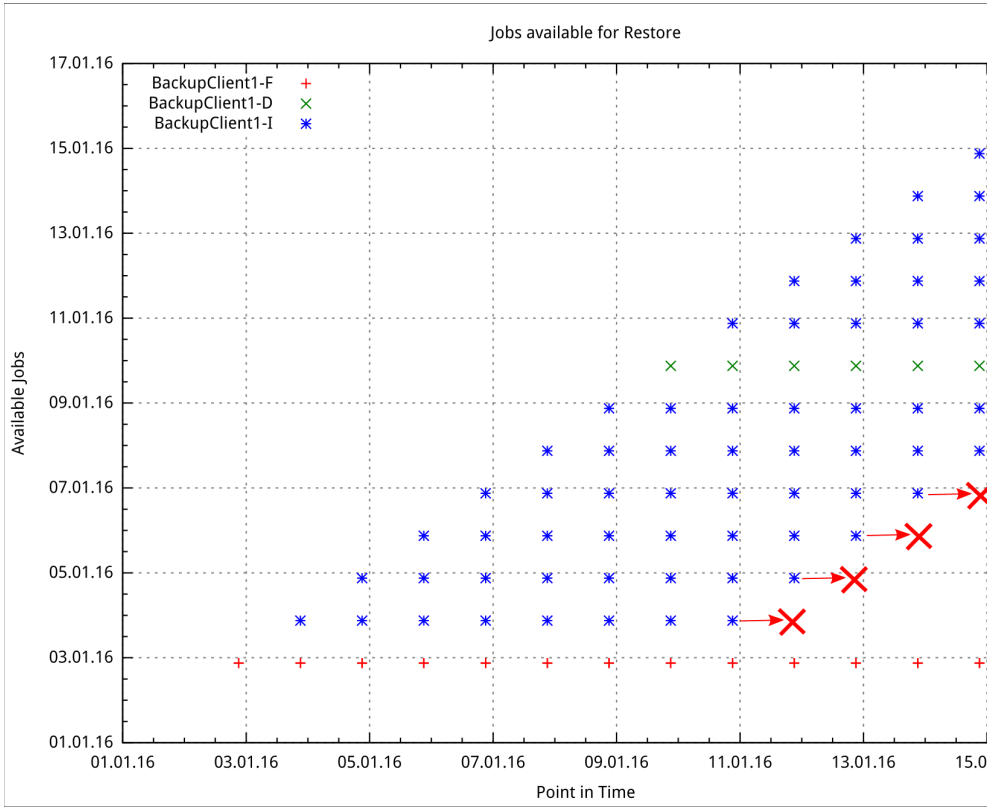
# The Consolidation Job

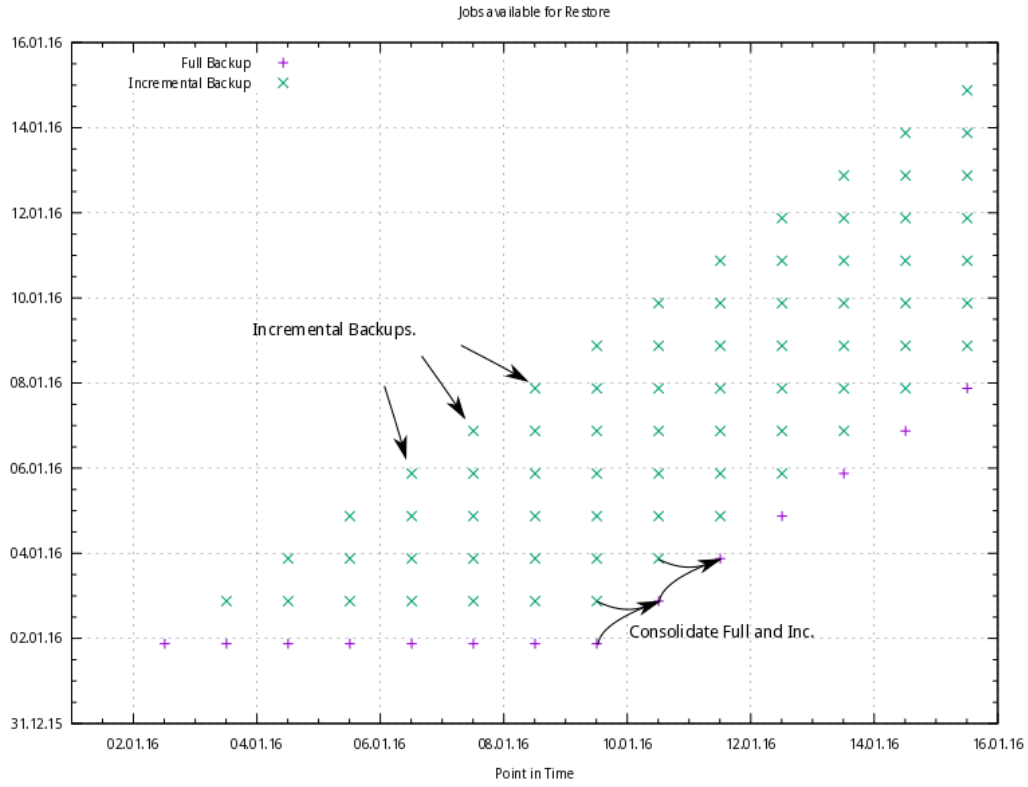
- Loops over all Backup Jobs
- Starts virtual backups according to Always Incremental settings

# Job availability with always incremental backup scheme

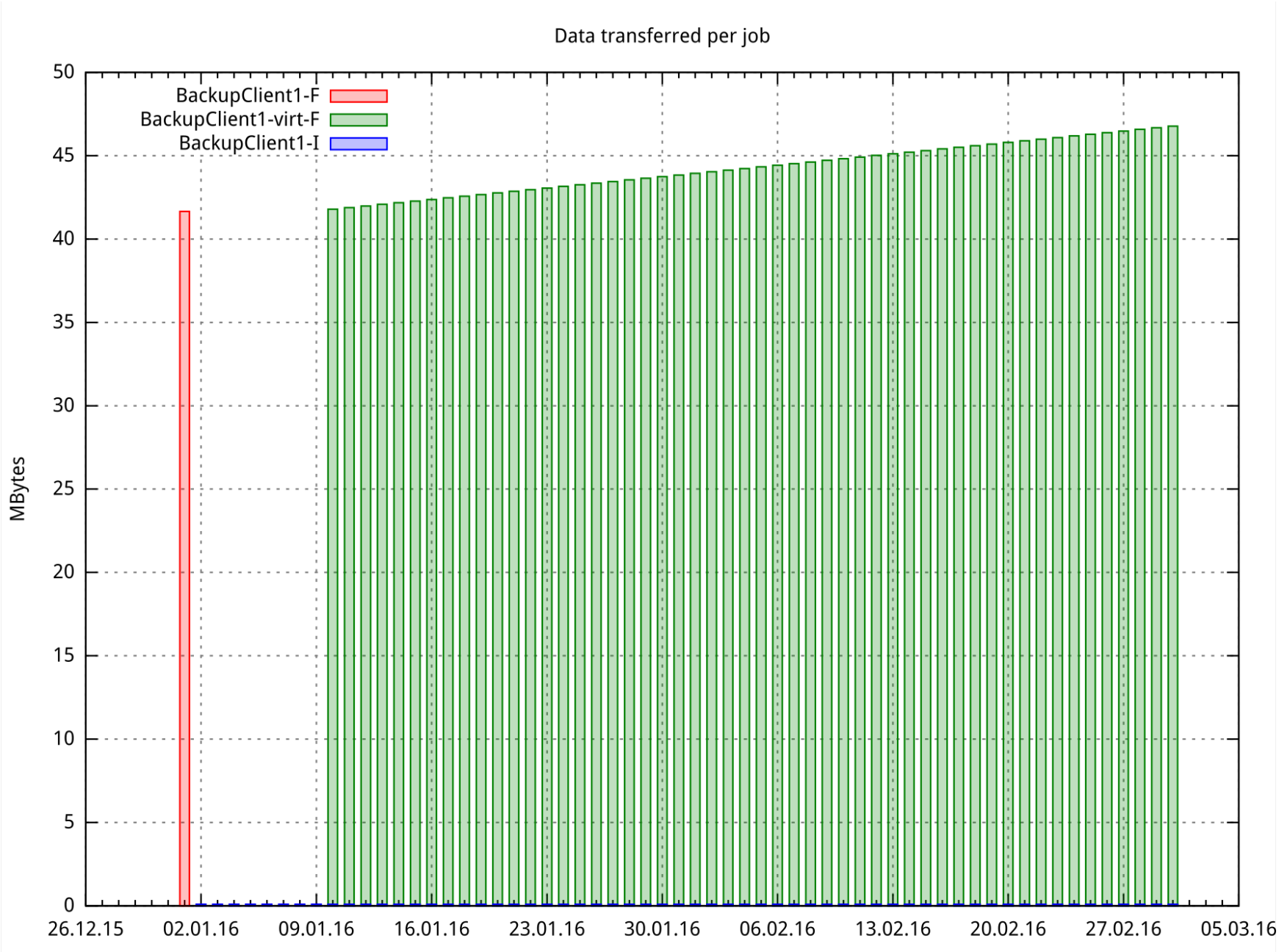


# Job availability compared



# Always Incremental Jobdata



# Always Incremental Jobdata - Problem

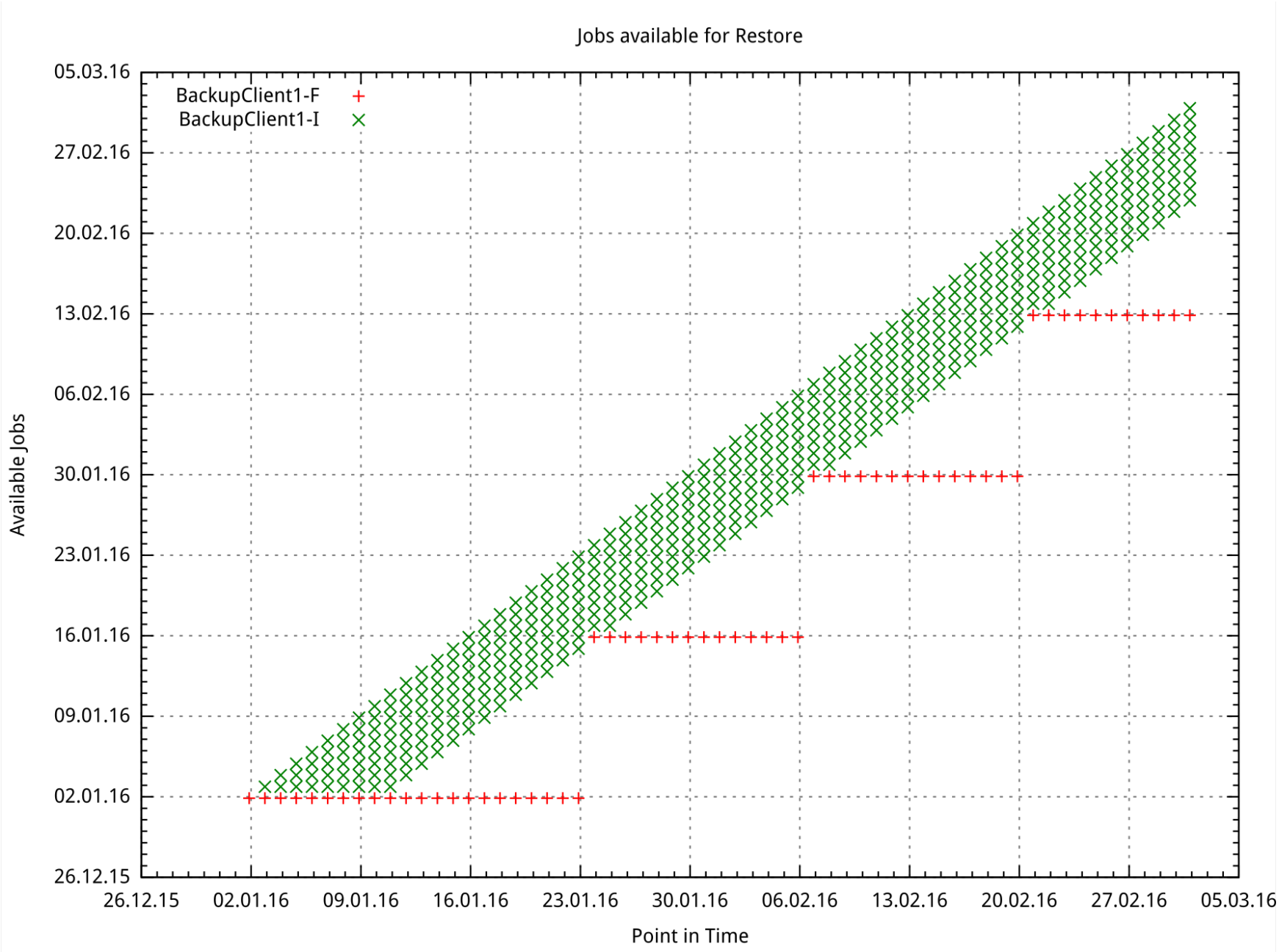
- good: mininal data from the client
- bad: Every day the consolidation runs the whole client data is moved during consolidation
- impossible for a large number of clients

# Always Incremental Jobdata - Solution

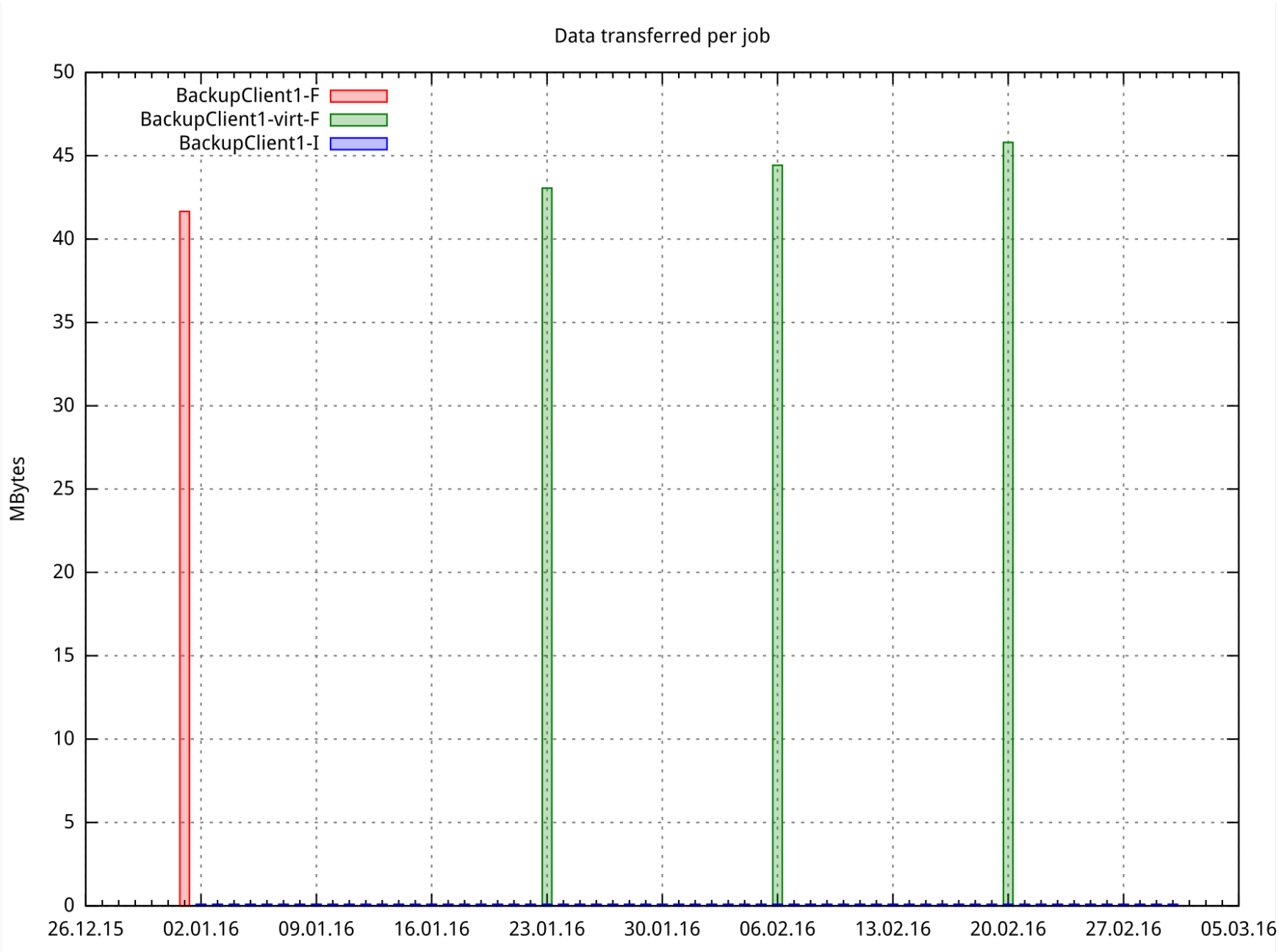
- only consolidate latest incremental during consolidation
- leave the full backup as it is during daily consolidations
- consolidate the full in longer intervals

```
Job {
    Always Incremental Max Full Age = 21 days
}
```

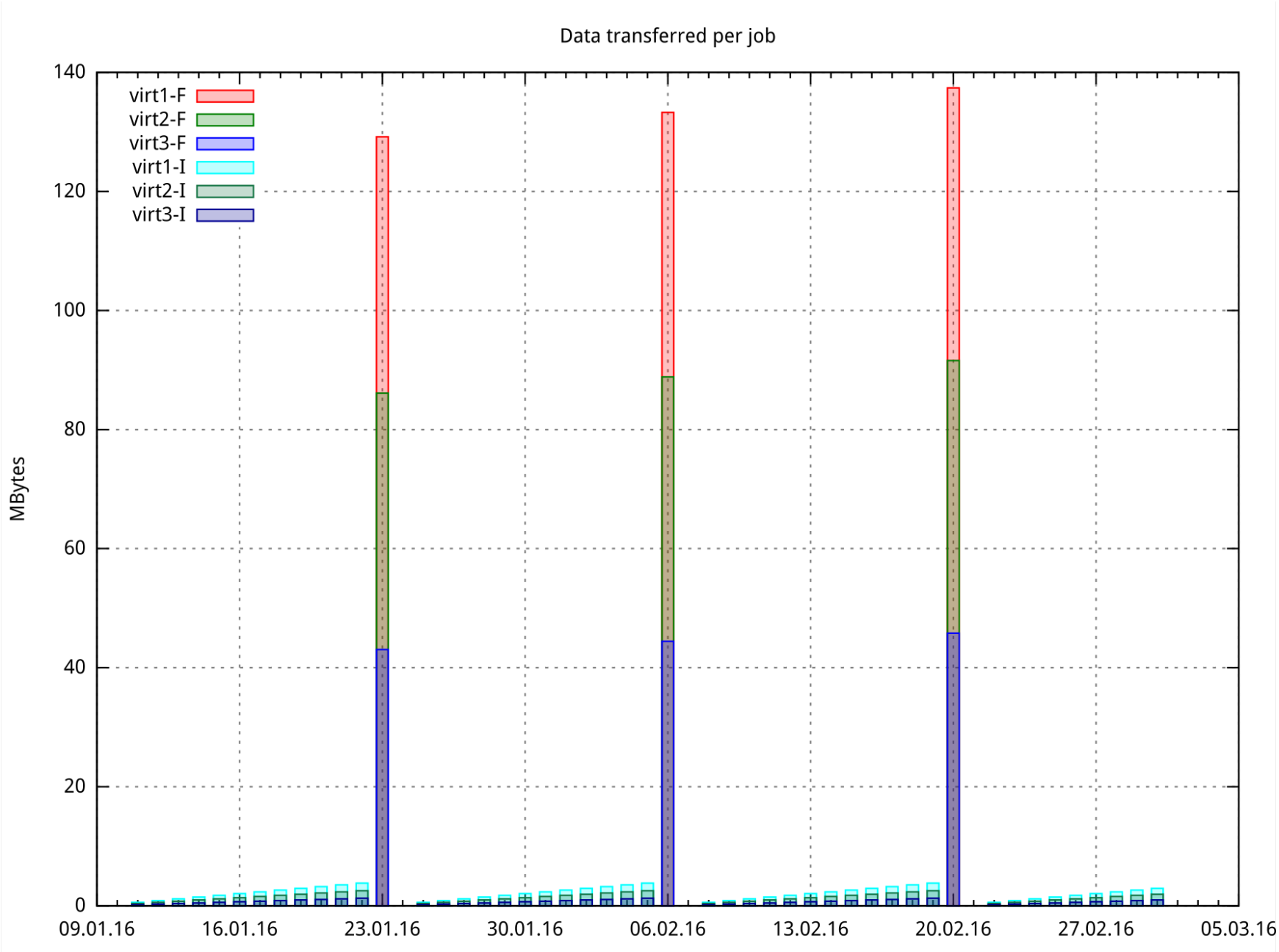
# Always Incremental Max Full Age = 21 days



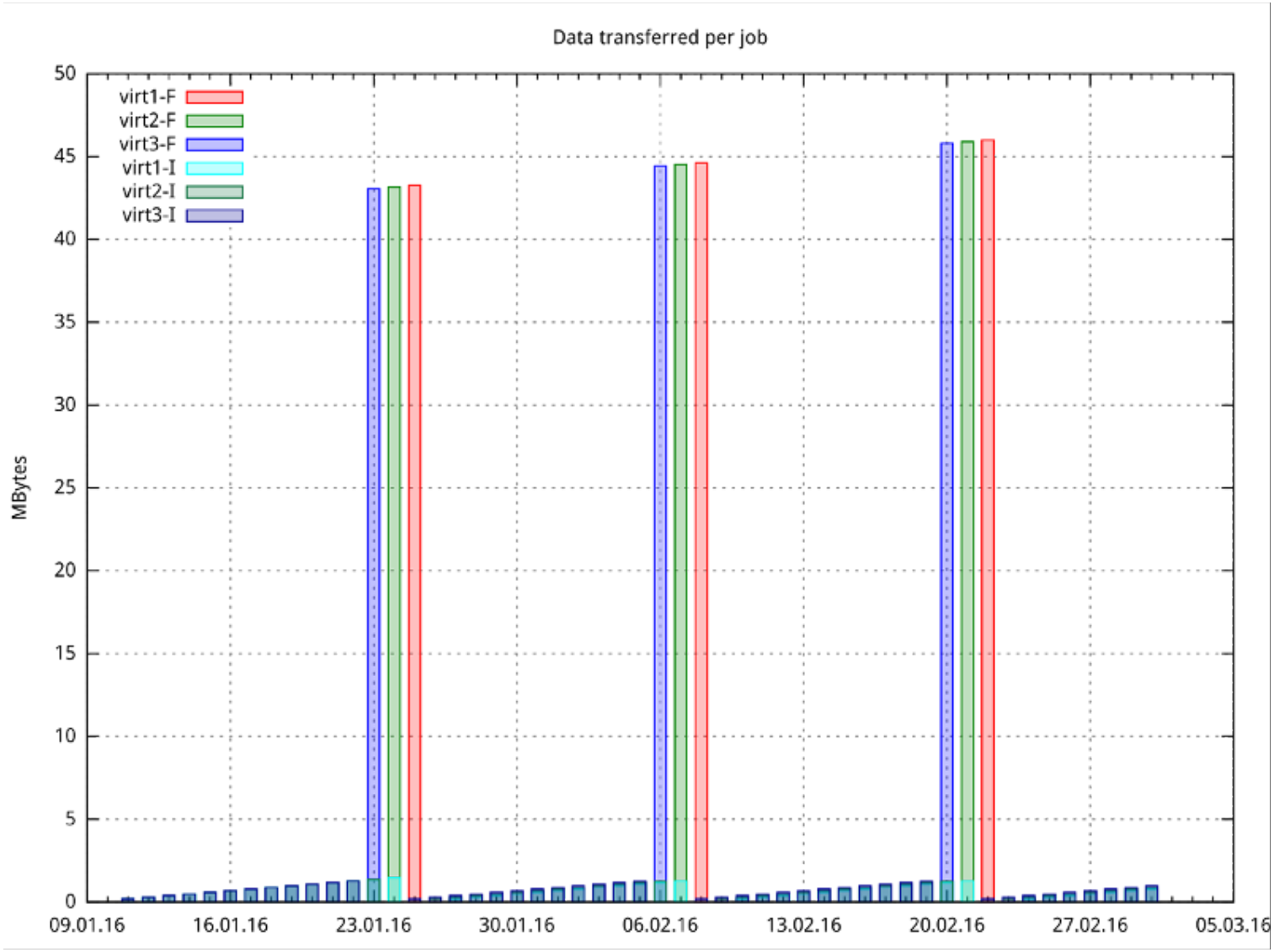
# Always Incremental Max Full Age = 21 days



# Always Incremental Max Full Age with multiple clients



# Always Incremental Max Full Age with multiple clients and Max Full Consolidations



# Always Incremental configuration overview

## Backup Job

```
Job {
  Always Incremental = yes                   # enabled?
  Always Incremental Job Retention = 7 days # how long is the job history?
  Always Incremental Keep Number = 7         # guaranteed number of incs left?
  Always Incremental Max Full Age = 21 days # if full is older it will be
                                             #  part of the consolidation
}
```

## Consolidation Job

```
Job {
  Name = "Consolidate"
  Type = Consolidate
  Max Full Consolidations = 1  # how many consolidation jobs
                               # with full included can be started
}
```

# Always Incremental summary

- Only incremental Backups are done from the client
  - Minimal network load
  - Minimal backup time
  - In backup window

# Always Incremental summary

- Consolidation is done locally on storage
  - Outside of backup window
  - Very fast as local
  - Existing backups are consolidated into new backups
  - No holes in the backup history
- Defined incremental backup history is always available
- Adequate for File Backup, NOT for plugin Backups

# Subdirectory configuration scheme

- Before
  - one configuration file per daemon:

```
/etc/bareos/bareos-dir.conf
/etc/bareos/bareos-sd.conf
/etc/bareos/bareos-fd.conf
```

  - Configuration file contains all configuration resources
  - Including additional configuration files complicated

```
@/file/to/config/file
@|"/etc/bareos/generate_configuration_to_stdout.sh"
```

# Subdirectory configuration scheme

- New
  - one configuration directory per daemon:

```
/etc/bareos/bareos-dir.d
/etc/bareos/bareos-sd.d
/etc/bareos/bareos-fd.d
```

  - one configuration file per resource in resource type directory:

```
/etc/bareos/bareos-dir.d/pool/Differential.conf
/etc/bareos/bareos-dir.d/pool/Incremental.conf
/etc/bareos/bareos-dir.d/pool/Full.conf
/etc/bareos/bareos-dir.d/director/bareos-dir.conf
/etc/bareos/bareos-dir.d/console/bareos-mon.conf
/etc/bareos/bareos-dir.d/storage/File.conf
/etc/bareos/bareos-dir.d/job/BackupClient1.conf
```

  - Including additional configuration files is easy,

```
 /etc/bareos/bareos-dir.d/*/*.conf is automatically loaded
```

# Subdirectory configuration scheme

- compatibility:
  - if */etc/bareos/bareos-dir.conf* exists, it is used
  - otherwise config subdirectories are used.

# Configuration API

- Uses new configuration directory layout
- Create client via director API or bconsole

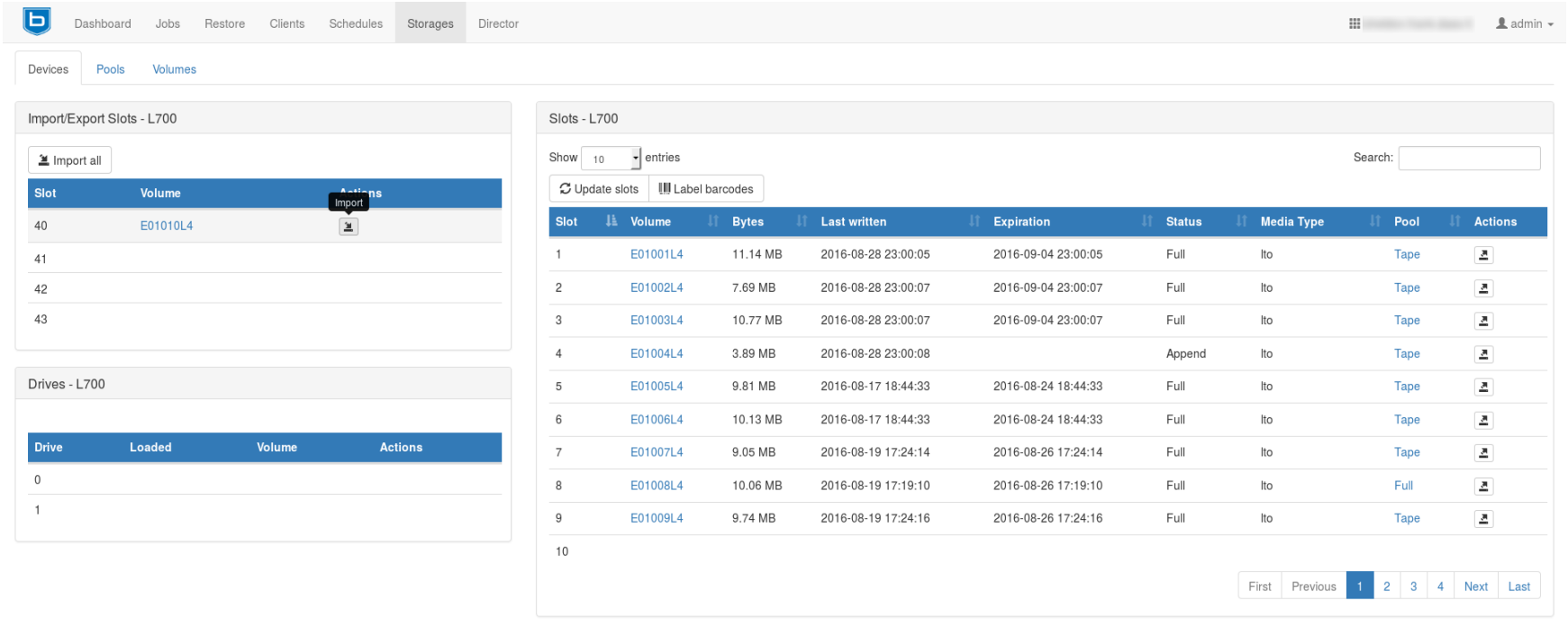
# Enhanced ACL support

- Fixed inherited ACL limitations in the director
- Affects bconsole, Web UI and director API
- Full multi-tenancy support
- Definitions of rules and roles
- Users can only access and see data according to role access
- Prerequisite for web UI as self-service-portal for restore

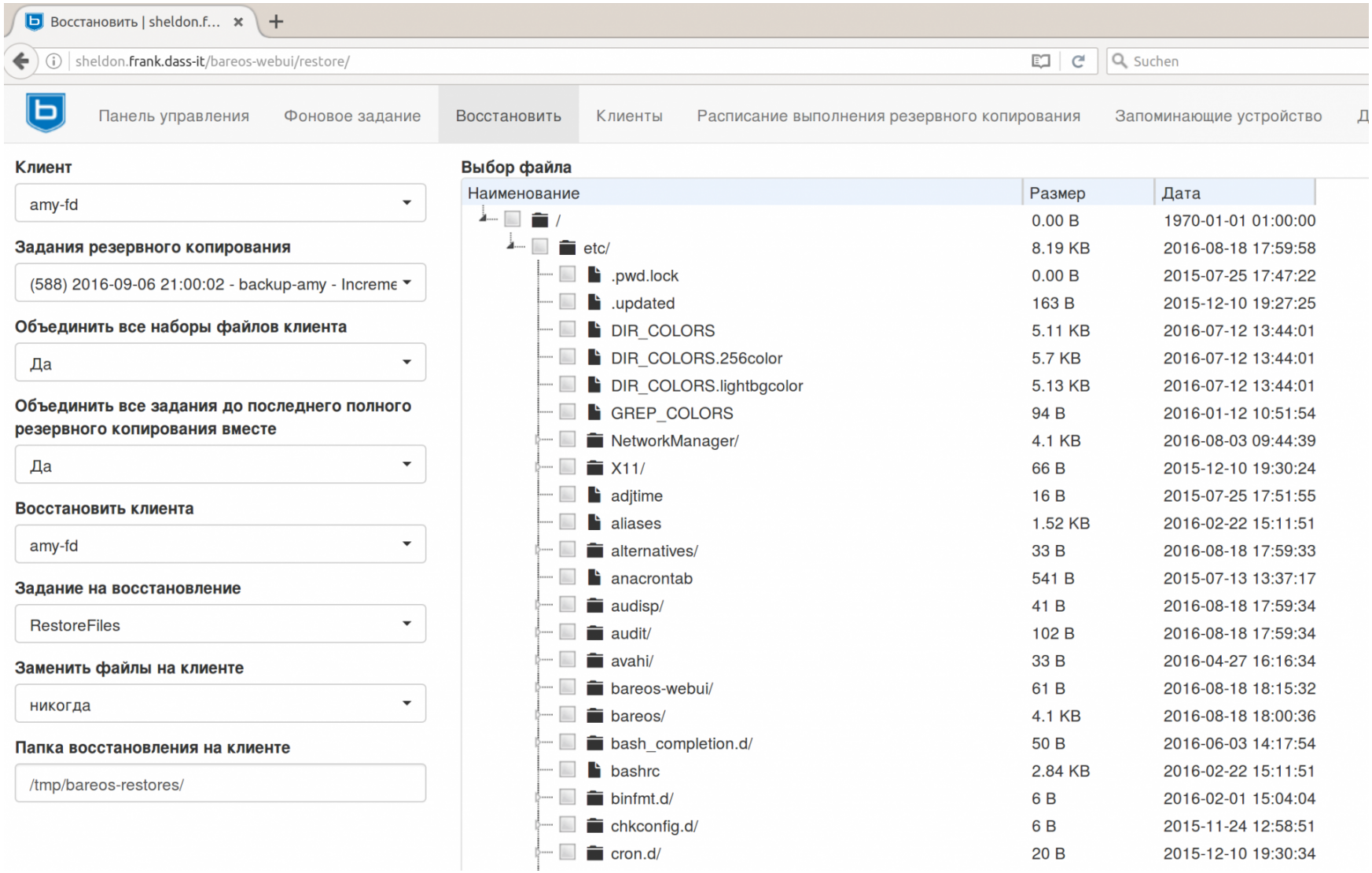
# News from the web UI

- Multi-language support
  - German
  - English
  - French
  - Russian
- Client overview shows available FD updates
- Media Handling
- Autochanger support

# Autochanger View



# Restore in Russian Language



# NDMP Enhancements

- Disk-To-Disk-To-Tape Support
- LMDB Backend for NDMP FileHierarchy Data (to be able to handle very large number of files)

# New MySQL / MariaDB Plugin

- Uses xtrabackup from Percona
- Incremental backups for INNODB tables
- Hotbackup
- Point-In-Time Recovery

# Roadmap

- NDMP: Backup to storage attached tape drives
- Performance Enhancements for large environments
- RHEV / oVirt Plugin
- Deduplication
- Enhance configuration API
- Webui
  - Use configuration API
  - Job availability Graphs
  - Performance Graphs included

# Thank you