

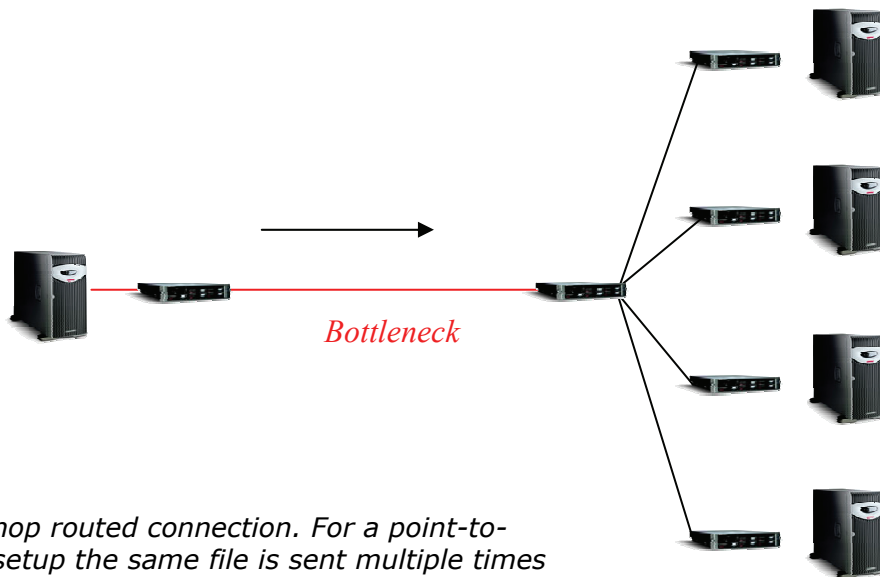
IP Multicast with ControlCenter Enterprise

Point-to-point transmission

The default operation mode for ControlCenter transmission is point-to-point file push operation where the send site initiates and manages the transmission based on production data. The transmission is done according to planning data including the edition distribution plan and priorities of pages.

For the main sending hub the schemes with multiple point-to-point connections will inherently put stress on the central server(s) as number of receive sites increases. Therefore, server and internal LAN resources must be scaled to serve worst case requirements to transmission.

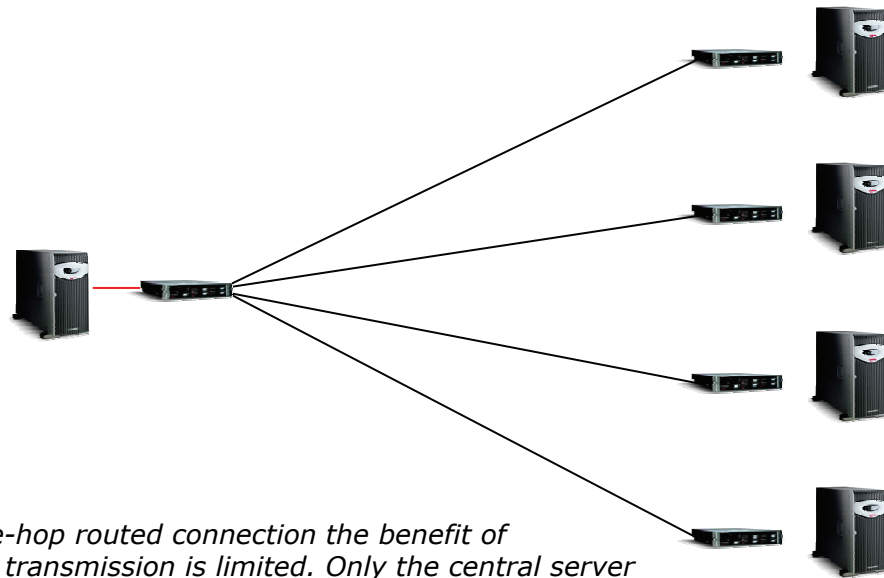
Land lines typically are circuit switched leased lines or ISDN lines, or packet switched frame relay links. These lines form router based WAN networks where sites are interconnected through one or more router 'hops'. For multi-hop connections data packets are routed from site to site in paths where intermediate routers between the sites exist (like the internet).



Multi-hop routed connection. For a point-to-point setup the same file is sent multiple times over the shared line segment – once per receive site.

Benefit of send-once multicast technology

In case of multi-hop connections where part of the line is shared between multiple links, it is beneficial to implement a scheme where files common for the sites involved are only sent once down the shared line and then distributed locally by routers. This technique is denoted multicasting (see later).



For single-hop routed connection the benefit of multicast transmission is limited. Only the central server and the internal segment up until the first router will benefit from multicast transmissions.

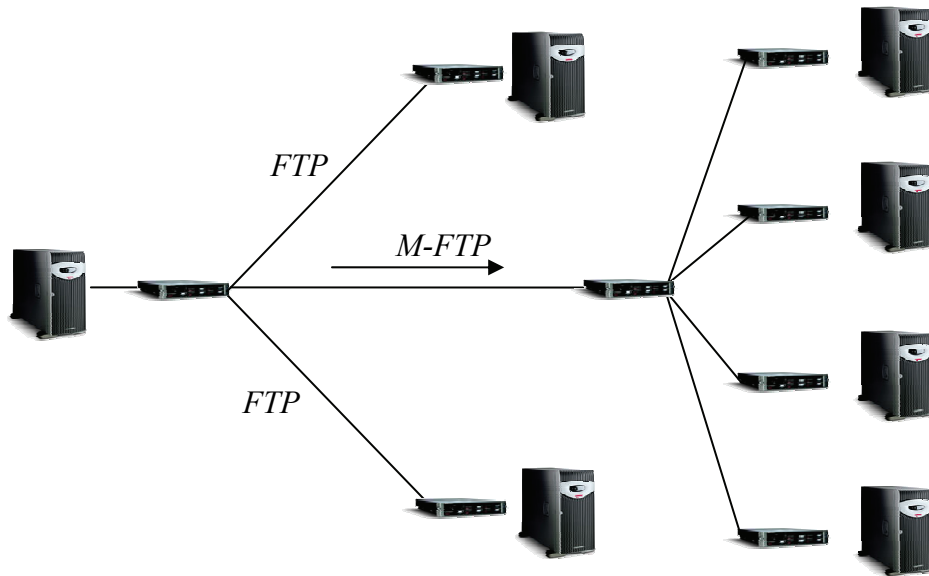
Multicast technicalities

Multicasting is the process of sending files to multiple receivers in a single file transfer seen from the sending point of view. The native IP (IPv4) protocol is specified to handle multicast but not all routers are multicast-enabled.

The main difference from traditional IP broadcast is that a group address specified in the IP header. Otherwise multicast is like broadcast: UDP packets are sent out without any acknowledge messages flowing back to the sender. Therefore higher level mechanisms must exist to ensure delivery feedback to the sender.

Starburst MFTP

For image file transmission ControlCenter can use the multicast-based MFTP package from StarBurst Software Inc. MFTP is combining Multicast with the robustness of the FTP protocol to deliver scalable multicast solutions.



M-FTP (Multicast FTP) utilizes shared line segments better due to the group based transmission scheme. Note that non-multicast groups can still be connected point-to-point.

ControlCenter can combine multicast and point-to-point operation so that some sites run as normal point-to-point connected sites. Because the underlying connections are persistent WAN lines, multicast is only used when beneficial.

File flow

The ControlCenter central database holds information about pages on a per-site basis, meaning that a particular page can have different status for each of the target locations. This is true regardless of transmission method. For group based multicasts all affected page status entries are updated to 'transmitting' simultaneously when the transmission is initiated. However, the 'transmitted' status is not necessarily set at the same time for all sites as this status comes from back from the remotes sites when the file has been checked only.

Pagename	Color	region	RegionGroup	Status	Extstatus
3	C	West	All	Not ripped	N/A
3	K	North	All	Ripped	N/A
3	K	North	North region	Ripped	N/A
3	K	Northwest	All	Transmitted	N/A
3	K	Northwest	North region	Transmitted	N/A
3	K	South	All	Imaged	N/A
3	K	West	All	Transmitting	N/A
3	M	North	All	Not ripped	N/A
3	M	North	North region	Not ripped	N/A
3	M	Northwest	All	Not ripped	N/A

ControlCenter site-receive status can be different for a page even if the page is physically the same.