**Sun Microsystems Sun Ray™ Thin Clients – Competitive Brief**  
*(INTERNAL CLEARCUBE USE ONLY)*

**Summary:**
1. Sun Ray is Sun’s implementation of thin clients, with all the standard pros and cons.
2. It is targeted at companies/environments that use a lot of Unix Client/Server applications.
3. To run standard Windows desktop applications, Sun Rays require a hefty integration with Citrix and/or Microsoft Terminal Services (with Tarantella) making installation and maintenance very complex.
4. The Sun Ray solution addresses only a very narrow market niche and is not a viable Windows “desktop replacement”.

Basically, Sun Ray is a Unix-centric thin client solution which has a few unique pros, but with extra cons and a very limited marketplace fit.

**Sun Ray Architecture**

Sun Ray server-based-computing has a large Solaris server as the center of its architecture. The Sun Ray client runs Java apps and is an X-windows terminal for server applications running on Solaris. If you want to run Windows applications, you have to set up a separate Windows (or Citrix) terminal server system and connect that back into the Solaris server. The Citrix or Terminal Server system does application delivery to the Solaris server, and then the Solaris server relays (via standard Unix X-Windows) the Windows application image over to the Sun Ray client. Sun actually expects most users of their system to be primarily users of Unix client/server applications, but we have seen some customers deploy it for Windows apps where there is a very small number of Windows applications to support and in some high security environments.

The following figures depict what is described above – the first shows Citrix being used for the Windows applications and the second shows an implementation using Windows Terminal Server combined with technology from SCO spin-off Tarantella.

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**Citrix MetaFrame ICA Client Model**

- **MetaFrame**
- **Terminal Services**
- **Windows Server**
- **ICA protocol**
- **ICA clients (Solaris or Java)**
- **Sun Ray Server**
- **Switch**
- **Sun Ray appliance**

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**Window Terminal Services / Tarantella Model**

- **Windows Terminal Server**
- **RDP protocol**
- **TN3270 protocol**
- **3270 Mainframe**
- **AIP protocol**
- **Tarantella**
- **Sun Ray Server**
- **Switch**
- **Sun Ray appliance**
Sun Ray’s Key Selling Point
Where some customers find the solution interesting enough to implement, is that since you must log into the central Solaris server, and everything gets funneled through that server, a person can leave one Sun Ray station, go to a completely different floor or building, sit down at any other Sun Ray station, login, and immediately be reconnected to the session they left with all applications still up and running. Some of the Sun Ray thin client devices have an integrated smartcard slot which causes an automatic login for the card’s owner when it is inserted. Pull the smartcard out, you’re disconnected, go to another Sun Ray, insert the smartcard, and you’re automatically reconnected back to your running session. This is the key aspect that Sun markets and is what you’ll hear the Sun sales force talk about most often.

Although ClearCube’s current I/Port connection model via Grid Center is device-centric, our customers can still use RDP to reconnect into the same session from multiple locations using the standard RDP client – just like with Sun Ray functionality.

Key Drawbacks of the Sun Ray Solution
The Sun Ray architecture has been sold by Sun since at least 1999, and it’s never gained a large following. The key problems are the same as with standard thin clients but with even more added complexity due to the requirement of both a Solaris server and a Citrix or Terminal server.

With the December 2004 release of Version 3.0 of the Sun Ray software, Sun began claiming that the Sun Ray solution is now WAN capable and have even mentioned potentially selling Sun Ray delivered services to home users. The interesting point is that until now, Sun never told its customers to limit Sun Ray use to LANs. It was just a well known fact that the bandwidth consumed by Sun Rays was higher than other thin client solutions. Early benchmarks show that with Version 3.0, Sun Ray bandwidth consumption can sometimes be as much as 50% lower than before, but it still uses significantly more bandwidth and has higher network latencies than our PC Blade solution.

In summary, the following key drawbacks are evident with the Sun Ray solution:
- Very complex and costly installation and maintenance (more so than traditional thin clients)
- High network bandwidth requirements
- Standard thin client limitations including limited software application support, poor scalability, limited performance, inconsistent end-user experience, etc.

The bottom line is that the Sun Ray has a very niche market. It cannot play in the standard application delivery space that is Citrix’s sweet spot, and Sun Ray is even more difficult and costly to architect and implement than classic “server-based computing.” Therefore, it’s virtually never viable as a Windows desktop replacement.