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TECHNOLOGY AUDIT

IGEL Universal Desktop

IGEL Technology

BUTLER GROUP VIEW

ABSTRACT

IGEL Technology, one of the world's top five thin client vendors, has delivered a new range of Universal Desktop devices. Its thin client devices are aimed at small, medium, and large organisations across all verticals and address both the issues associated with traditional PCs, and the opportunities offered by digital services and desktop virtualisation. IGEL's new Universal Desktop devices and Universal Management Suite offer a good range of hardware functionality and management controls, supporting the full spectrum of digital services using a variety of connection methods. Of particular note is IGEL's introduction of a Universal Firmware Concept, whereby just one firmware image per operating system is available across all hardware platforms and Entry, Standard, and Advanced digital service 'packs' can be unlocked during manufacture. In Butler Group's opinion, IGEL's solution would benefit any organisation that wants to reduce its power consumption (and associated carbon footprint), consolidate desktop devices (remove the need for telephones, for example), and reduce the overall management overhead of desktop device provision.

KEY FINDINGS

- Device power consumption, including the necessary data centre power and cooling, can be 70% less than a traditional PC.
- Functionality rich hardware and IGEL's Universal Firmware Concept.
- The ability to deliver the full range of digital services to the thin client device.
- IGEL's easy-to-use Universal Management Suite is provided with all devices.
- Some Digital Services, such as Desktop Virtualisation, are still embryonic.
- IGEL's devices operate with Windows Embedded Standard 2009, Windows Embedded CE, and Linux.

Key: Product Strength | Product Weakness | Point of Information

LOOK AHEAD

Corporate demand for thin client devices will grow as organisations seek to reduce end-user computing costs, and minimise energy costs and their corporate carbon footprints. IGEL has continued to innovate in the thin client market and is well positioned to meet the anticipated growth in demand for thin client technology.

FUNCTIONALITY

Traditional PCs are becoming more powerful in terms of the processing capability, driven by applications demanding increased resources such as memory and processing power. This increased performance consumes a significant amount of power, generates noise and heat, and requires a significant footprint on the desktop, which makes optimising floor space more complex and costly. When the management cost of PCs is also taken into account the total cost of owning these assets becomes significant for even small organisations.

Thin client solutions provide organisations with a cost-effective method of deploying computing to remote or branch offices, whilst retaining control of the costs associated with maintaining the equipment. The migration to thin client devices also helps address long-held PC provision and support issues: time to deploy; fault frequency and management, image management (including software licence management and operating system upgrades), security, disaster recovery, flexible working, and the ability to manage desktop infrastructure centrally.

Product Analysis

Digital services and desktop virtualisation are changing the thin client technology market. Firstly, thin clients used to attach users to Windows terminal services and shared one instance of an application between many users. Unfortunately, some ten percent of applications were problematic using terminal-services technology, forcing companies to still use PCs as ICA/RDP clients to host these problematic applications. Virtual PCs, where every user has their own server-hosted x86 virtual machine with operating system and applications, are overcoming some of the traditional weaknesses of terminal services since no application is shared and most will happily run in this server-based environment. This reduces the corporate reliance on desktop PCs and opens the way for thin clients as access devices.

Available Q1 2009, IGEL's new Universal Desktop solution is designed as a convergent device that can deliver almost any server-based application over a network. The solution is designed to provide a PC-like user experience, easy control and management, and the delivery of cloud computing wherever it is needed. The IGEL solution comprises:

- A range of thin client devices (Universal Desktops).
- Remote management software (IGEL Universal Management Suite 3).
- Security (smart card plus third-party solutions).
- Experience enhancement features such as Virtual PC appliance mode and Digital Service Virtualisation (using third-party technology from firms such as RES Software).

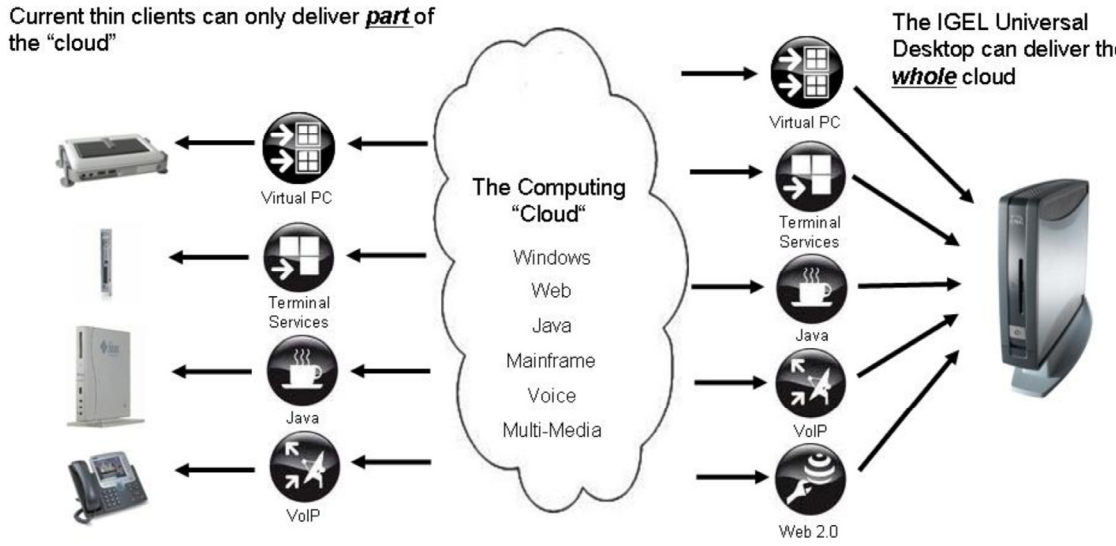
IGEL's Universal Desktops have a standard PC desktop look and feel such that a user cannot tell the difference between it and a traditional fat PC; even USB peripherals, multi-media, and moving graphics function correctly. All local digital services, such as Voice over IP (VoIP) or MediaPlayer, can be controlled from the server-based Windows desktop with no need to toggle between digital service sessions using the native thin client interface. The Universal Desktop device even delivers difficult server-based applications and multi-media types including Flash, VoIP, video conferencing, and local device control (CCTV and industrial automation).

Universal Desktop devices also retain the traditional thin client benefits, with no data held locally, virus immunity, security, and ease of management – using IGEL Universal Management Suite 3, all aspects of application delivery and user experience are easily controlled without ever having to visit the devices during roll-out and production.

The new range of Universal Desktop devices ship with what IGEL terms its 'Universal Firmware Concept'. There is only one image for each available operating system (Windows Embedded CE, Windows Embedded Standard 2009, and Linux) and each image contains a rich set of digital services for connecting to a server-based infrastructure. The digital services are divided into three 'packs' (Entry, Standard, and Advanced) that provide different levels of server-based access at different price points. Each universal image is available across all the different hardware platforms in IGEL's range. Hence, to order a device, customers simply choose an operating system, digital service pack, and hardware platform. The device is then flashed, tested, and shipped.

By deploying IGEL thin client devices, in conjunction with a centralised server consolidation and virtualisation strategy, organisations are able to realise significant benefits in terms of asset management, power savings, and flexibility of asset use. Butler Group believes the Universal Firmware Concept and rich functionality of the new IGEL devices to be a step change in thin client device design.

Figure 1: IGEL Universal Desktop Overview



Source: IGEL

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Product Operation

The technologies that the IGEL Universal Desktop solution uses to deliver digital services are divided into three main areas: the user experience, remote device management, and delivery.

User Experience

IGEL Universal Desktop devices have the ability to use a variety of methods to deliver a server-based Windows desktop, whether it is based on terminal services or a virtual PC that feels just like a traditional PC. It does this by giving customers five different tools to deliver a server-hosted Windows session or digital service: basic ICA/RDP, Virtual PC Appliance mode (turning the Universal Desktop into a dedicated virtual PC terminal for Citrix or VMware), multi-media redirection, independent digital services (where each digital service runs as a separate session on the Universal Desktop device), and Digital Service Virtualisation (where digital services can be activated from the server-based Windows desktop but run locally on the device).

Remote Management

IGEL's Universal Management Suite (software supplied with every product) is the control panel used by IT departments to manage their Universal Desktop device estate and ensure that organisations are getting value from their IGEL investments. Actions may be applied to an individual device or group of devices and can be scheduled or performed in real time. These actions include:

- Reboot – to force a change to take effect such as a new security patch.
- Shutdown and wake up – used for power saving and to ensure that devices are ready for use when users arrive in the morning.
- Send message – where remote-support staff can inform users of problems or obtain more detailed issue information.
- Shadowing – where a remote-support user can view the full screen of the device being shadowed and take control to resolve any issues.

Every aspect of the Universal Desktop solution is controllable using Remote Management's easy-to-use point-and-click interface – not only the hardware, OS, or sessions (like locale, screen resolution or a Citrix session) – and Remote Management can also control the digital service (including VDM, SAP, Firefox, VoIP, etc.). IGEL Remote Management Suite is also network friendly: imaging uses HTTP and FTP protocols (rather than PXE) so network routers do not have to be re-configured, and to facilitate network-wide updates Workgroups can have a single IGEL unit designated as a 'buddy' that can be used to re-image all other devices behind the gateway such that WANS are not stressed.

Digital Service Delivery

From January 2009, IGEL will completely re-architect and rename its hardware range to reflect its role as a set of engines to power the functionality in the Universal Firmware. In addition, three new devices are being introduced – the UD2, UD3, and UD5 platforms.

The UD2 is IGEL's entry-level Universal Desktop. It comprises a VIA Eden 400MHz processor and VIA CN700 chipset, with up to 1GB of DDR2 RAM. Graphics have DualView support (optional Y-cable), 1x DVI-I connector (resolution VGA 1920x1440 or DVI 1600x1200) and Unique DVI Plus. Because of its processor speed, the UD2 cannot accept the Advanced-level digital service pack on Linux or Windows Embedded Standard 2009.

The UD3 is IGEL's mid-level Universal Desktop. It comprises a VIA Eden 800MHz processor and VIA CN700 chipset, again with up to 1GB of DDR2 RAM. Graphics have DualView support (optional Y-cable), 1x DVI-I connector (resolution VGA 1920x1440 or DVI 1600x1200) and Unique DVI Plus. There are also five USB ports, one more than the UD2, and a smartcard reader may be added as an optional extra. The UD3 can be expanded with an optional 'digital foot' giving Wi-Fi networking and a parallel port.

The UD5 is IGEL's high-performance, top-level Universal Desktop. It comprises a VIA C7 LP 1.5GHz processor and VIA CN896 chipset, with up to 1GB of DDR2 RAM. Graphics have 'Full DVI' DualView support, 1x DVI-I connector (Resolution VGA 1920x1440 or DVI 1600x1200), 1x DVI-D connector (Resolution 1600x1200), and Unique DVI Plus. There are six USB ports, an optional integrated smartcard reader, a PCI extension slot, two serial ports (one more than the other two devices) and 10/100/1000 Base-T Ethernet (the other two devices have 10/100 Base-T Ethernet). All devices have 1x PS/2 (keyboard), 1x line-out and 1x mic-in ports. The UD5 can also be expanded with an optional 'digital foot' giving Wi-Fi networking and a serial port.

For customers wanting more specialised solutions, IGEL offers the UD7, a high-powered graphics platform offering quad screen output, and the UD9, an integrated unit that combines the thin client into an LCD panel. Finally, IGEL offers a PC-to-thin-client conversion card that replaces a PC's C drive (allowing it to boot from a Linux flash image) and helps price-sensitive organisations that want to convert their old PCs into thin clients. Strictly speaking, however, the PC-to-thin-client conversion card falls outside the Universal Desktop range since it has a unique image.

Universal Firmware Concept

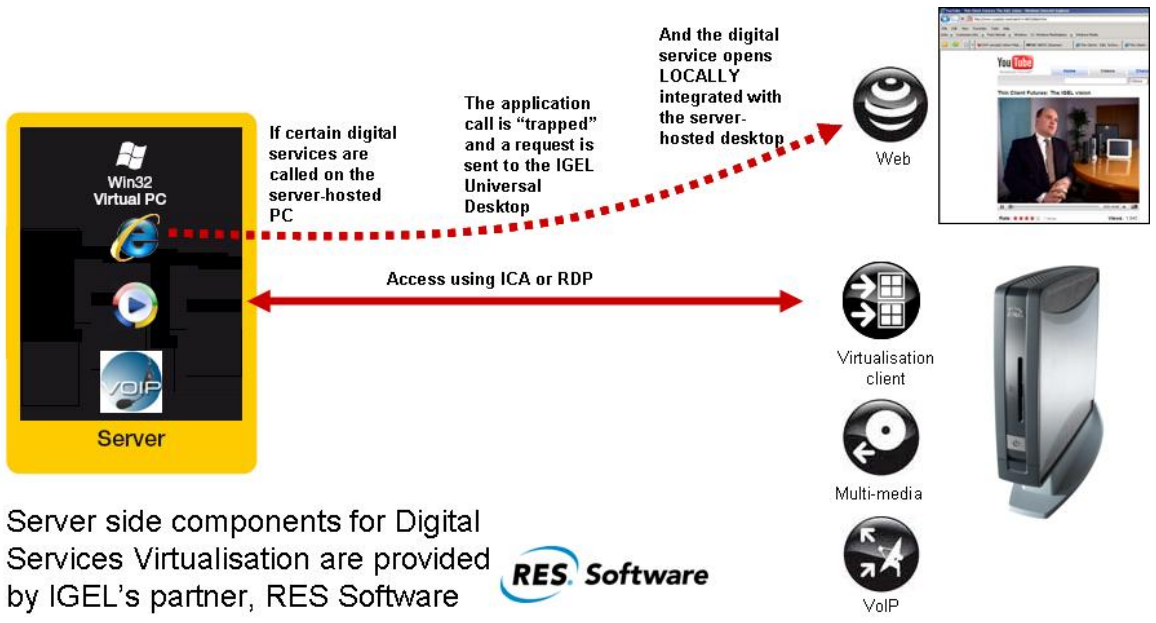
With the new Universal Desktop devices, IGEL offers one firmware image per operating system which includes all available digital services/features, deployment technologies, and security features. This is divided into three different digital service levels (Entry, Standard, and Advanced) which are unlocked during order-based manufacturing. This provides greater flexibility for customers, particularly if they require a low-end hardware device to deliver mid-range functionality, or a high-end hardware device to deliver basic ICA/RDP (if they want to embed their own applications in flash that requires the increased hardware power). This approach also offers faster turnaround time for customised firmware images.

Virtual PC Appliance Mode and Digital Service Virtualisation

Virtual PC appliance mode is available for both Citrix XenDesktop and VMware View. Users access their virtual PC after a simple login, the session is always maximised (so that it can't be shrunk to an icon and 'lost'), and ctrl-alt-del key behaviour is controlled such that users can't kill the virtual PC or terminal.

Digital Service Virtualisation allows the toughest server-based applications (multi-media, video conferencing, VoIP, and peripheral control) to be delivered within a terminal-services desktop or a virtual PC. This is achieved by 'reverse publishing' a digital service from the IGEL Universal Desktop back to the server-hosted Windows desktop. When the relevant program is run, the application call is trapped by server software (RES Software's Powerfuse) and a command is sent to the Universal Desktop device to open the digital service locally within the server-hosted Windows interface. IGEL provides Digital Service Virtualisation 'building blocks' – software connectors that allow key Universal Desktop digital services to be reverse-published to a virtual PC or terminal-services desktop – as free downloads via their Web site.

Figure 2: IGEL Digital Service Virtualisation



Source: IGEL

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Product Emphasis

IGEL is redefining its thin client offerings at the right time, given the increasing demand for low-cost and low-energy computing coupled with the anticipated corporate push for virtual PCs. IGEL's aim is to provide Universal Desktops that provide organisations with device consolidation and mid-life redeployment opportunities.

Whilst the thin client market has been in a state of flux, with many vendors not having a clear vision of what business value the technology can deliver over and above the already documented security and management savings, IGEL has delivered a compelling product. By focusing on how the hardware can become a compatible device, IGEL has turned the normal convention of a software pervasive world on its head to provide the equivalent of a television that operates with any digital service provider.

DEPLOYMENT

Due to the functionality of the IGEL management tool and the devices' inherent simplicity, the expertise required to deploy and manage IGEL thin client devices is less than that of PCs. However, a higher level of expertise is required for managing the applications that provide the digital services in the data centre (such as Microsoft terminal services, VMware virtualisation or Citrix). If Digital Service Virtualisation is used, then IT functions will also need to be familiar with the RES Software's Powerfuse application.

IGEL has found that its devices are mostly deployed in a modular fashion – either department by department or when PCs need to be refreshed – the main exception being greenfield roll-outs. Post deployment, depending on the level of thin client to PC replacement levels, an organisation can function with fewer, higher-skilled, support staff. IGEL states that customers often report that the thin client architecture also results in higher IT staff morale as they use higher-level skills and have fewer desktop-related issues to fire fight.

End users do not need product training and system administrators, responsible for the operation of the Remote Management Suite, require just a single day's training. IGEL operates a tiered approach to support with the first point of contact being the Value Added Reseller (VAR); these VARs have access to IGEL.com and the IGEL knowledge base, but if the problem cannot be resolved by either of these options it is passed to the support engineers in Bremen, Reading, and Ft Lauderdale. If the problem cannot be resolved at this level it is then passed on to the development engineers in Augsburg.

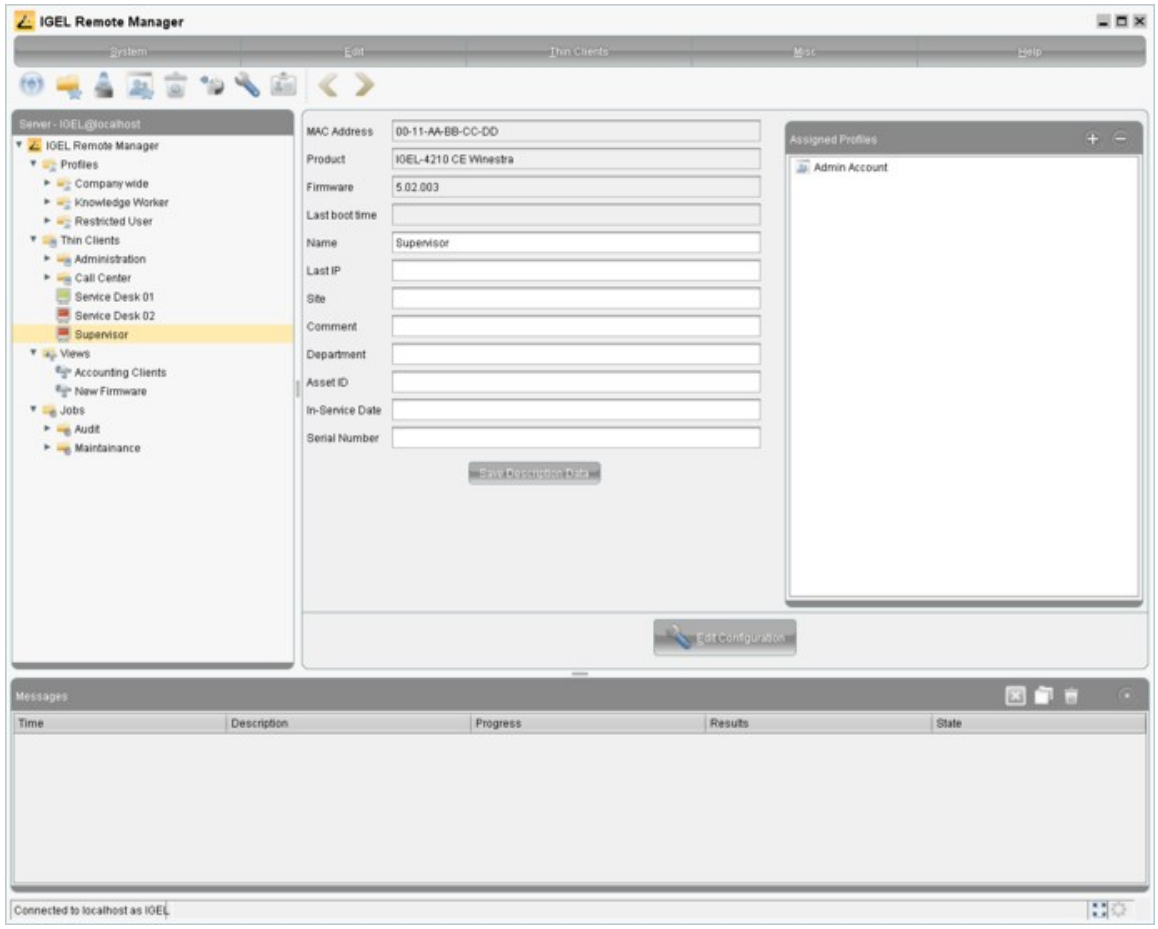
The IGEL thin client devices are available under Linux, Windows Embedded CE, and Windows Embedded Standard 2009, and the IGEL Remote Management Suite runs on Windows Server or Linux and supports SQL, Oracle, and DB2 databases. The IGEL Universal Desktop is dependent on RES Software's Powerfuse for Digital Service Virtualisation. IGEL devices support fourteen different hypervisors, four different virtualisation brokers, and the Citrix XenDesktop Appliance standard. The standard, published by Citrix in Q1 2008, ensures that any compliant access device connected to Citrix XenDesktop behaves exactly as a normal PC would. IGEL has also extended this concept to VMware View.

IGEL thin clients come with built-in legacy-terminal emulation (based on Ericom PowerTerm). This allows them to access older green-screen applications based on legacy-terminal emulations such as DEC VT100 and IBM 3270. As the devices can run multiple sessions, it allows a user to have windows accessing both old and new applications simultaneously. IGEL terminals are also capable of accessing legacy server-based WIN32 applications via the Web using the Citrix Web interface client, and can be used as VoIP clients and integrate with legacy telephone switches using third-party gateways from integration partners such as VCOMM.

The IGEL Universal Desktop solution is not dependant upon any other product but, as with all remote devices, suffers from the traditional single point-of-failure argument. Effectively any thin client is dependant upon the network; if this is not available then the device is useless. However, modern corporate networks are constructed with high degrees of resiliency and rarely become completely unavailable; more likely a service is present but at a reduced performance. At a device level, to increase resilience each IGEL device carries two copies of its image, just like a server cluster. So even if there is a power failure during re-flashing there is always a backup image for the device to boot from.

Two potential areas of risk for any thin client deployment are user resistance (either through user attachment to their 'personal' computer or users regarding thin clients as depicting lower organisational status than PCs) and organisations that keep thin clients in perpetual pilot mode, resulting in twin architectures (thin and fat client) and higher overall IT costs.

Figure 3: Example IGEL Remote Management Suite Screen



Source: IGEL

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PRODUCT STRATEGY

IGEL targets all verticals, with particular emphasis on verticals with specific requirements that thin client technology can readily address:

- Retail – where a large number of small remote locations require access to central systems; typically the support costs associated with deploying PCs in such a geographically diverse environment are high.
- Healthcare – where data security is a paramount concern and having PCs with local disks represents a risk.
- Transport – where the operating environment is more industrial than office space, and requires PCs to operate in temperature extremes or dusty conditions.

- Finance – the requirement for multi-channel displays in dealing rooms, and data-security concerns.
- Lower Education – where the device must be capable of operating in environments that require a robust resiliency to accidental misuse, i.e., child proof.
- Higher Education – where the device must be secure enough to operate in environments that are exposed to intentional attempts to corrupt the PC, i.e., PhD hacker proof.

According to IGEL, thin clients are now penetrating all vertical markets, and lower-volume deployments can be found in organisations at just the ten-user level. In addition to traditional thin client markets, IGEL is also targeting new opportunities:

- As access devices for virtual PCs.
- Organisations actively seeking to reduce energy costs and their corporate carbon footprints.
- Device consolidation opportunities – where organisations can save money on hardware purchases and a single management tool.
- Niche markets such as mobile users (paramedics) and multi-screen environments.
- Applications with no user (digital advertising).

IGEL distributes its products through the channel – supported by IGEL sales representatives for key accounts. In July 2008, IGEL signed a distribution agreement with IQ Sys Ltd, a desktop virtualisation specialist and the UK's largest Citrix distributor. IGEL also partners with Virtual Open Desktop (Alchemy Systems, Egham) to offer a complete Open Source Small to Medium-sized Business (SMB) office solution for UK£4.99 plus VAT per month including IGEL Universal Desktop (more details are available at www.virtualopendesktop.com). IGEL is a founding member of the European Thin Client Forum and leads the server-based computing and thin-desktop division of Bitcom, Germany's IT industry association. IGEL has key technology partnerships and alliances with Citrix (Premium Alliance Partner), VMware (Technology Alliance Partner), RES Software (Technology Partner), Microsoft (OEM customer), and VIA (Business Partner).

All software licence costs are built into the hardware product cost, including the IGEL Remote Management Suite which includes a free database licence (Java database). Firmware upgrades for each OS and the Remote Management Suite are made twice a year; hardware is refreshed every 2.5 to 3 years. Technical support and software upgrades (giving customers access to the latest bug fixes and digital service upgrades) are free for the product; with firmware upgrades offered for three years after a product's end of life. IGEL Remote Management Suite maintenance is also offered free and the latest version will work with any Universal Desktop device that has the latest Remote Management Suite client in the firmware.

Butler Group believes the thin client market is still in a pre-consolidation phase, currently there are a large number of vendors but with only two of the big three chip manufactures (VIA and AMD) active. Butler Group considers that innovative vendors such as IGEL will help create a new market for thin clients and, if this becomes a widely adopted technology, then consolidation and new entrants will reshape the vendor landscape. However, Butler Group does not believe that this situation will arise imminently; rather we predict this will happen within three years dependant upon the adoption profile of next generation thin client devices.

COMPANY PROFILE

IGEL started in 1988 as a division of the Melchers trading company – distributing UNIX server systems and terminals. In 1996 it took over the master distributor agreement for IGEL terminals and, in 1997, it developed its first Citrix thin client based on Linux. In 2001 the division was made a separate daughter company, IGEL Technology GmbH. The company grew rapidly on Linux and introduced Windows CE in 2003 and Windows XPe in 2005. IGEL became the world number three thin client vendor in 2007 and has held the number one position in Germany, the second largest thin client market in the world after the United States, since 2006.

IGEL has its corporate headquarters in Bremen, Germany. Other key locations include Augsburg, Germany (near Munich) for R&D; Reading, UK for Sales and Support; and Fort Lauderdale, Florida for Sales and Support, and Logistics. It also has offices in Singapore and Hong Kong. IGEL employs 89 people, with 72 of these based in Germany (Bremen 45 and Augsburg 27); 10 in the USA, and 7 in the UK. The functional breakdown of employees is R&D 26%, Sales and Support 45%, Marketing 6%, Operations 19%, and Administration 4%.

As a private company, IGEL does not disclose detailed financial information. However, it is a profitable and stable part of the 202 year old Melchers group in Germany. IGEL's largest customer has 16,000 devices running concurrently, managed by one IGEL Remote Management Suite server that hosts 67 device profiles. Key clients include over 100 different German Sparkassen (savings banks), Baumer insurance (Germany), United Rentals (USA), Maastricht University (NL), Plus (Tengemann Retail Group, Germany), Les Schwabb Tyre, CSK (USA), Allied Carpets (UK), SwissPort (Ch), and Commerzbank Leasing (Germany). IGEL has over 10,000 customers with a total customer base of some 480,000 devices. The forecast for the current year is 140,000 units and IGEL's geographical distribution (for branded devices) is Western Europe 90%, USA 6%, Central/East Europe & Mid East/Africa 2%, Asia/Pacific 1%, and Canada 1%.

SUMMARY

As well as being a well-established vendor in the thin client market, IGEL must also be considered a thought-leader on its future direction. In Butler Group's opinion, IGEL has pre-empted the anticipated increased corporate demand for thin client devices, particularly that organisations now expect lower cost desktop devices which are capable of handling the increasingly diverse array of tasks, digital services, and proprietary protocols.

Consequently, IGEL is well positioned to take advantage of the new thin client landscape – having developed a product set that delivers the ever-expanding range of digital services on a single, low-cost desktop device. With the added attraction of supporting corporate green agendas and the inherent demand for business agility – through low-energy consuming devices that can be quickly reconfigured as business demands dictate.

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