



## **CV – Olof Lagerkvist**

3 years university program, Computer Engineering Science with similar to BA degree. (2002)

IT Manager for a manufacturing industry group, Hydria Invest between Aug 1998 and Aug 2000 and between Apr 2002 and Dec 2006. Experiences from this work are very wide, from technical support on most levels, development of applications for presentation of statistics and other information to the users to integration of various network architectures and operating system environments. Also included project team leading for development teams of consultants and contract programmers. The Hydria Invest group had offices in Sweden, Norway and Denmark, retailers in Britain and Finland. Manufacturing units are located in Sweden.

System and network administration have been mainly focused on integration of local office networks over VPN connections, integration of user account databases between Windows and Unix servers and similar. Software development has been focused on integration of various CRM/Order/Sales management software and manufacturing/production software with time/cost/scrap optimization and similar. Development tools and languages have mostly been C/C++ in cases of Unix and C++/VB6/VBA/Access with COM/ODBC interaction with databases and Office applications in Windows.

System developer at Atronic Försäljning AB, Gothenburg, Sweden, full time between Oct 2007 and June 2011 and then part time since July 2011. The company develops a payment transaction system for micro payments, with a total of around 300,000 daily users in various customer installations around Sweden. Work has been focused on modernizing applications written in various old development tools to modern .NET (VB.NET/C#) architecture, as well as development of new applications and modules following customer preferences. This has involved development of components and an own payment transaction framework particularly in VB6, VB.NET, C# but also a few modules written in C++. The older, now replaced, code was originally written in Canon Basic (DOS) and VB6. The role has also included working with integration of Japanese cash registers with Swedish credit card and fiscal unit hardware, with close contact with development team in Japan.

Contract works between from July 2011 and on have mostly been for development of drivers, system administration and recovery tools, tools for digital forensics and similar, as well as applications for manufacturing industry, production and project planning applications etc. Technologies involved have been C#, VB6, VB.NET, WDK, C/C++, DPAPI, WMI, Hyper-V, SQL Server, MySQL, LinqToSQL, EntityFramework. Among developed applications is for example a disk image mounting application that can mount disk images as virtual disk drives either using OS file system drivers or other file system implementations that can bypass file system security, partially corrupt file systems and similar. It can also launch disk images as virtual machines and automatically bypass account passwords, DPAPI protection etc to make forensics analysis easier.

*References available on request.*

## Experiences from programming projects

- July 1998 – Aug 1998 *Visual Basic, VBA, C++.* Tool for presentation of statistical data out of text files exported from a Unix system. The Visual Basic part had a dialog box with options such as sum/avg/date searching and the data tables and diagram was presented in Excel using COM. The C++ part was a DLL file that exported to the Visual Basic part some functions for retrieving the text files from Unix over FTP.  
*Client: AB Borås Ventilation, Borås, Sweden.*
- Aug 1998 – Sept 1998 *Visual Basic, VBA.* Manufacturing industry tool for calculating sizes of pieces that need to be made ready for the complete products with a very simple user-friendly presentation on paper. This was essentially an Excel sheet with VBA code for collecting data from various places on the sheets and compile them to something user-friendly printable.  
*Client: KMI Luftteknik AB, Fritsla, Sweden.*
- Sept 1998 – Feb 1999 *Visual Basic, VBA.* Visualized “price list” with a visual view of add-on selections to a base product and presentation of each retailer’s price. The price data was collected from an Excel workbook and calculated and presented as choices were selected in the graphical user interface.  
*Client: KMI Luftteknik AB, Fritsla, Sweden.*
- Apr 1999 – Dec 1999 *Visual Basic, VBA.* Specialized Word and Excel templates with connections to various databases both through ODBC interfaces but also through VBA functions to collect data using COM interfaces or by reading text files.  
*Client: Björklunds-Gruppen AB, Borås, Sweden.*
- Aug 2003 – Apr 2004 *Visual Basic, VBA.* Integration of manufacturing planning application from a machinery supplier with order management software by Visual Basic components to extract order data and planning and inserting order jobs in the manufacturing order system. This included certain levels of conversions, for example converting priority levels and reporting produced units back to the order planning system.  
*Client: Bröderna Rasch AB, Motala, Sweden.*
- Sept 2003 *C++ Win32:* Tool for monitoring Exchange mailbox through file API and notifying users about new e-mail.  
*Client: Hydria Invest AB, Borås, Sweden*

- Sept 2003 *C++ Win32*: Tool to be used as the shell application of a Windows session that is used only to connect to a Terminal Server and then, when the TS client exits, displaying a message box asking user if the computer should be powered off or logged on again.  
*Client: Hydria Invest AB, Borås, Sweden*
- Nov 2004 – Jan 2005 *Visual Basic, VBA, Access, VB.NET, COM, ODBC*. An Access based application for printing Product Labels (stickers on produced units with information about batch number, date/time and possible type certifications etc). The Product Label database used Visual Basic functions to collect data from order system using ODBC sources (first version) and then storing a record for each label in an MS SQL database for archive purposes and as a source for the actual printing component. The order system held one record for each order line but this database required one record for each printed label, for example an order line with production of four units lead to four records in the label database. With each record much statistical data was stored, for example about who printed and signed the labels for certified products and which date and time they were printed.  
The database was later changed to use a COM component exported from a VB .NET application that read exported XML files from the order system instead of directly reading using ODBC (this may sound strange but was due to a slow and buggy ODBC interface provided by the order system).  
*Client: Bröderna Rasch AB, Motala, Sweden.*
- Mar 2005 – Dec 2005 *Visual Basic*. Add-on tools to a manufacturing planning system for material planning. This included a tool with a very simple graphical user interface for searching for products using specified criteria and update (adding/removing, update quantities etc) underlying parts of the product to create or remove the “trees” of products used for planning down to the parts the products are produced from.  
*Client: Bröderna Rasch AB, Motala, Sweden.*
- Jan 2006 – June 2006 *Visual Basic, COM, ODBC*. Various user defined search and edit tools for quick editing of databases in an order system that requires COM interface for manipulation (ODBC etc cannot be used). This includes user interfaces for tools for example to change a field for all customers within a specified range of postal codes etc.  
*Client: Bevent Rasch AB, Borås, Sweden.*

- Feb 2005 – May 2005 *Visual Basic, VBA, COM.* Programming of a production statistics system that presented the volume of units to be produced in each part of a workshop. The information was presented on a large monitor and collected every 30 minutes by a Visual Basic based database reader that loop through and filtered data extracted through a COM interface. This was then divided by the budget for each production group and presented by an ASP page. (The ASP was mainly written by someone else.)  
*Client: Bröderna Rasch AB, Motala, Sweden.*
- June 2005 – Dec 2006 *Visual Basic, VBA, VB.NET, C#.* Programming of integration components for an Intranet solution for presentation of statistical data to sellers and providing them with simple click and view listings about what is currently and historically going on (tenders, orders, shares of orders/tenders etc) with particular customers, including collecting data from order systems, from databases covering official statistics about customers results etc and presenting the client's share of selling to each particular customer. The integration components were for example about night-time collection of statistical data from various databases, running queries to filter and calculate and log certain interesting things found, up to the queries in the ASP pages that presented the diagrams, data tables and listings.  
This project also included some .NET components for interaction with some of the databases. (The ASP was mainly written by someone else.)  
*Client: Bevent Rasch AB, Borås, Sweden.*
- Oct 2006 – *VB.NET, C#, C++ Win32 etc.* Server, workstation and network administration, including development of some system support tools simplifying network management and some applications for simplifying system maintenance in a manufacturing industry.  
*Client: Profiduct AB, Jönköping/Bankeryd, Sweden.*
- Dec 2006 – *Visual Basic, Access, Excel, Word, MS SQL.* Development of project management software, time reporting systems, applications for nesting, time and scrap optimization etc for manufacturing industry. Reports integrated in Excel and Word templates. Some applications are still occasionally adjusted.  
*Client: Viskadalens Plåt & Papptak AB, Fritsla*
- Oct 2007 – June 2011 *Visual Basic, VB.NET, C#, VB/ISAM, MS SQL, Team Coherence.* Adjustments and further development of existing VB6 applications, development of new applications for a payment transaction system with internal card system, cash register system, mostly in VB.NET, C# and VB6.  
Integration development targeting CRM and HR systems and similar, various databases, report systems etc.

Development of a framework with an object model encapsulating VB/ISAM database API for simplifying .NET development targeting this database model, as well as client-server model and transaction handling for such database requests, a .NET reflection based model for mapping entity classes for VB/ISAM databases and similar.

Newly developed applications contain approximately 60,000 lines of VB.NET code.

Clients for customer specified development have been in particular larger catering operators, public sector and larger industrial companies.

The role has also included working with integration of Japanese cash registers with Swedish credit card and fiscal unit hardware, with close contact with development team in Japan.

*Client: Atronic Försäljning AB, Hisings Backa*

Aug 2011 –

*Visual Basic, VB.NET, C#, VB/ISAM, MS SQL, Team Coherence.*

Some part-time adjustments and further feature implementations on projects for above client.

*Client: Atronic Försäljning AB, Hisings Backa*

Sept 2011 –

*C#, MS SQL, Linq to SQL*

Modifications to a project/order/manufacturing planning system with customer relations features, price calculation, tender and order follow-up features etc. Adjusted many features according to client needs and added many features, for example calendar views of amount of orders for delivery at particular weeks or days etc as well as various follow-up reports and similar. Moved much of data mining from application to stored SQL Server procedures accessed using Linq to SQL classes.

*Client: Profiduct AB, Bankeryd*

Oct 2011

*VB.NET, ASP.NET 3.5, Linq, Web Services*

Development of a web site that shows timetable and realtime data for public transport departures from stops within Sweden. Retrieves data from various public transport executives' web services and parses through a Linq based common interface.

*Client: LTR Data (own work)*

Dec 2011 – Feb 2012

*VB.NET*

Integration project adding support for a new payment service provider (bank cards/credit cards) to an existing cash register application.

*Client: Atronic Försäljning AB, Hisings Backa*

- Nov 2011 – Jan 2012     *C/C++, VB.NET, C#, .NET 4.0, WDK*
- Development of a .NET 4.0 based framework for integrating ImDisk Virtual Disk Driver in .NET based projects. Simplifies usage by providing simple .NET methods for installing, loading and communicating with the driver parts of the projects. All library files included as on-demand extracted resources which does not require any additional components to be installed.
- Client: US based digital forensics company*
- Feb 2012 – April 2012     *VB.NET, MS SQL, Entity Framework (Code First)*
- Data remodelling of existing class library for payment management applications, to conform to Entity Framework 4.0 with “Code First” model.
- Client: Atronic Försäljning AB, Hisings Backa*
- March 2012 – April 2012     *VB6, VB.NET, MS SQL, Linq to SQL*
- Migration of existing VB6 order/production planning application with MS SQL backend, to VB.NET and Linq to SQL entity classes, queries and data binding.
- Client: Viskadalens Plåt & Papptak, Fritsla*
- April 2012 – May 2012     *VB.NET, C++/CLI, C++*
- Development of library modules for other developers in projects with “piece-by-piece” migration of VB6 applications to VB.NET. An example is a C++/CLI module that can be used from VB6 applications to load and interact with, .NET forms.
- Client: Own work. Library used in various customer projects.*
- May 2012     *C, C++, WDK*
- Rewriting and refactoring of ImDisk Virtual Disk Driver to remove integrated GNU GPL licensed components and replacing most of them with new code with somewhat different design.
- Client: Active Electronics, UK*
- May 2012     *C#, MS SQL, Excel, Outlook, GhostScript, COM Interop*
- Changes to existing application for importing customer contact information from Excel workbooks to an MS SQL based application. Also development of components for interoperation with Excel and other applications to produce printouts to postscript files and then merging the printouts through GhostScript to a single PDF and automatically e-mail that document using Outlook.
- Client: Profiduct AB, Bankeryd*



- June 2012 *C/C++, WDK, WDM*  
Development of a WDM class filter driver for correcting status data returned from an existing hardware driver.  
*Client: RM Education, UK*
- June 2012 *C/C++, WDK, VB.NET/C#*  
Customer adjustments to existing driver code, including for example removing unused and not needed GPL licensed code to prepare driver code to be used in closed source commercial projects.  
*Client: LinkGard Systems, US.*
- July 2012 – Dec 2012 *VB.NET*  
Integration of cash register software and bank card service providers. Customer specific changes and plug-in system for existing cash register software.  
*Client: Atronic Försäljning AB, Hisings Backa*
- Aug 2012 – *VB.NET, Web, Linq, GhostScript*  
Development of a tool to synchronize local, cached copies of train timetables available on a web site and optionally merge them into a book-format printable PDF.  
*Client: Application distributed by LTR Data (own work)*
- Sept 2012 *WDK, C/C++*  
Development of device filter driver for battery devices. Software solution to a problem with faulty laptop motherboards that responded incorrectly to battery charge level requests.  
*Client: R M Education, UK*
- Oct 2012 – *VB.NET, C#, VB6, EntityFramework 4*  
Strategy and design for a future project for building new, .NET/EntityFramework based, database model for payment systems, to replace an existing VB6/VBISAM based database model.  
*Client: Atronic Försäljning AB, Hisings Backa*
- Oct 2012 – *WDK, StorPort, ScsiPort, C/C++, VB.NET, C#*



- Development of virtual SCSI adapter miniport driver, with .NET API library, for mounting image files of various formats supported by third-party libraries. I/O requests redirected from miniport driver to user mode libraries and user mode API requests handled by kernel mode driver.  
*Client: LinkGard Systems, US for Arsenal Recon, US*
- Aug 2013 – *WDK, StorPort, ScsiPort, SQLite, DevExpress, C/C++, C#, VB.NET*  
Implementation of several new features for an existing digital forensics application Registry Recon. Also development of several new features for the virtual disk driver Arsenal Image Mounter, originally developed via LinkGard for Arsenal Recon.  
*Client: Arsenal Recon, US*
- Feb 2014 – *WDK, C/C++*  
Implementation of VHD virtual disk image format in kernel mode for a “virtual desktop per user” solution. Included fixed, dynamic and differencing virtual disk types, live-merge-to-parent etc. Also included a way to connect to an image file across network using a single TCP/IP port.  
*Client: Ceedo Technologies, Israel*
- July 2015 – *WDK, C/C++*  
Implementation of several additional features for the “remote-VHD” solution, such as a Windows service that handled requests to several users individual image files etc.  
*Client: Ceedo Technologies, Israel*
- Sept 2015 – Feb 2016 *VB.NET, LinqToSQL, SQL Server*  
Development of new features in a production management application for manufacturing industry. Implementation of access control, user account permission concept with AD groups based application roles etc.  
*Client: Product AB, Sweden*
- March 2016 *SQL Server integration*  
Development of automatic synchronization of customer data between different applications.  
*Client: Viskadalens Plåt & Papptak AB*
- March 2016 – *WDK, C/C++*  
Disk filtering driver for student computers in schools to make sure that the computer is reset to a pre-defined state between each use session.

- Client: SBE, Germany*
- June 2016 *C#*  
Digital forensics tool Webmail Recon, that analyzes disks for traces from various webmail services and Hibernation Recon that analyzes Windows hibernation files.  
*Client: Arsenal Recon, US*
- June 2016 *C#*  
Digital forensics tool Webmail Recon, that analyzes disks for traces from various webmail services and Hibernation Recon that analyzes Windows hibernation files.  
*Client: Arsenal Recon, US*
- Aug 2016 – Oct 2017 *C#/VB.NET/AutoIt*  
Development of forensics application “Hibernation Recon”, that analyzes Windows hibernation files and extracts data of interest for forensics analysis. The project also included development of a conversion tool that converts AutoIt script language to VB.NET.  
*Client: Arsenal Recon, US*
- Jan 2018 – Mar 2018 *C#/VB.NET/SQL Server*  
Development of a time registration application in a project management system.  
*Client: Viskadalens Plåt & Papptak AB*
- Jan 2018 – present time *VB.NET/C/C++/WDK/WMI/Hyper-V/BitLocker*  
Development of new features in disk image mounting application:  
Features for launching a disk image as a virtual machine in a simple way, with features for automatically bypass Windows account passwords, DPAPI protection etc to make it easy to analyze web browser history, encrypted documents and similar. Also with integration with BitLocker to disable protection before launching image as virtual machine.  
Features for browsing files in disk image without using Windows file system drivers bypassing file security, partially corrupt file system state etc. A write filter driver that can write modifications to an image to a temporary location leaving the forensics image file untouched.  
Features for un hiding offline Volume Shadow Copies.

## System management tools, recovery tools etc

Large parts of work since about 2002 have also been various solutions to problems, technical advice and consultation, or development of special-purpose system management tools, disaster recovery software or components for forensic tools, mainly written in C/C++/VB/VB.NET/C# (some also on \*nix platforms). Parts of this work have later been released as free software (either independent device drivers or other small and useful system tools). One example is the *ImDisk Virtual Disk Driver*. Besides being a driver capable of mounting disk image files as virtual drives it can also mount partitions of hard drives on other computers on the network. This means that you can boot a dead Windows machine on a Unix Live-CD and run a special server tool and then an *ImDisk* driver on a Windows computer on the network can mount it and for example run recovery tools on that filesystem. Another example of a useful tool is the tar-like archive tool *strarc* that can be used as a backup tool or for other copying or archiving of files including all meta-data on an NTFS volume.

List of free system tools and other software: <http://www.ltr-data.se/opencode.html>

With best regards, Olof Lagerkvist