

ATHENA

Directory Structure

Windows

```
include
  athena.h
bin
  x86
  x64
lib
  x86
  x64
target
  install
  uninstall
  beacon - unload when not in use (clear memory) - never use
PAGE_EXECUTE_READWRITE
  command - unload when not in use (clear memory only)
  engine (self loading)
  dnsclient - host dnsclient.dll - forwarding dll
console
  builder (build target)
  listeningpost (bottle/cherrypy/pyopenssl - https file server)
  parser - decode responses and beacon history
  tasker - encrypt files / messages to target
deployment
  Athena_1_0_RC1
    BIN
      UNCLASSIFIED
      builder
      bin - location of target modules
      output
        20150814_09-50-06_6158
        receipt.xml
        installer_x86.dll
        installer_x64.dll
      listeningpost
      parser
      tasker
    DOC
Tests (unit tests)
  Dart
  TestInstall
  TestUninstall
  TestBeacon
  TestEngine
```

TestHost
Tools
ToolHash - Adler32 from zlib (could switch to md5 if we have collisions)
ToolEXEtoAXE
Offline
lin (this directory is copied from linux build environment)
 athena_offline
 x86
 x64
win
 athena_offline

Linux (include list of apt-get/yum/etc. to allow for dynamic generation of dev env)
env)

athena_offline (eclipse/make)
 x86
 x64

GIT Support

.gitignore

Build
build_out
*.suo
*.pyc
*.sdf
*.opensdf
*.vcxproj.user
*.aps
*.log
ipch/
Debug/
Release/
test.file
test_dir/
*.d
*.o
*.a
bin/
*.pch
*.obj
*.exe
properties.ant
working/
*.log

ANT Support

properties.ant

```
sitename=athena
buildversion=1_0_RC1
x86_supported=true
x64_supported=true
msbuild.directory=C:\\Program Files (x86)\\MSBuild\\12.0\\Bin
doxygen_supported=true
doxygen.directory=D:\\Program Files\\doxygen\\bin
winddk.directory=C:\\WinDDK
sysinternals.directory=c:\\sysinternalssuite
python.directory=d:\\python34.x64
```

build.xml - root

```
<?xml version = "1.0"?>
<project name="root" default="all" basedir=".">

  <property file="properties.ant" />

  <target name="call" description="build debugging version">
    <!-- NOTE ORDER IS IMPORTANT HERE -->
    <ant antfile="build.xml" target="${current.target}" dir="Tools" />
    <ant antfile="build.xml" target="${current.target}" dir="Code" />
    <ant antfile="build.xml" target="${current.target}" dir="Installer" />
    <ant antfile="build.xml" target="${current.target}" dir="Console" />
    <ant antfile="build.xml" target="${current.target}" dir="Tests" />
    <ant antfile="build.xml" target="${current.target}" dir="Deployment" />
    <ant antfile="build.xml" target="${current.target}" dir="Doxygen" />
  </target>

  <target name="debug" description="build debugging version">
    <property name="current.target" value="debug" />
    <antcall target="call" />
  </target>

  <target name="release" description="build releasable version">
    <property name="current.target" value="release" />
    <antcall target="call" />
  </target>

  <target name="test" description="validate project">
    <property name="current.target" value="test" />
    <antcall target="call" />
  </target>

  <target name="publish" description="copy solutions files to distribution
directory">
```

```

    <property name="current.target" value="publish" />
    <antcall target="call" />
</target>

<target name="clean" description="remove all generated files">
  <property name="current.target" value="clean" />
  <antcall target="call" />
  <delete dir="bin" failonerror="false" />
</target>

<target name="all">
  <property name="current.target" value="all" />
  <antcall target="call" />
</target>

<target name="lazy">
  <property name="current.target" value="lazy" />
  <antcall target="call" />
</target>

<target name="test_production" description="validate project">
  <property name="current.target" value="lazy" />
  <antcall target="call" />
</target>
</project>

```

build.xml - leaf

```

<?xml version ="1.0"?>
<project name="Engine" default="all" basedir=".">

  <property name="project.name" value="Engine"/>
  <property name="project.root" value="..\."/>

  <property file="${project.root}/properties.ant" />

  <!-- DEBUG -->

  <!-- X86 -->
  <target name="debugx86" description="build releasable version" if="${x86_supported}">
    <exec executable="${msbuild.directory}\msbuild.exe" dir="."
    failonerror="true" >
      <arg line="${project.name}.sln /m /nologo /t:build
/p:Configuration="&quot;Debug&quot;; /p:Platform=Win32" />
    </exec>
  </target>

  <!-- X64 -->

```

```

<target name="debugx64" description="build releasable version" if="$
{x64_supported}">
  <exec executable="$ {msbuild.directory}\msbuild.exe" dir="."
failonerror="true" >
    <arg line="$ {project.name}.sln /m /nologo /t:build
/p:Configuration=&quot;Debug&quot; /p:Platform=x64" />
  </exec>
</target>

<target name="debug" description="build releasable version">
  <antcall target="debugx86" />
  <antcall target="debugx64" />
</target>

<!-- RELEASE -->

<!-- X86 -->
<target name="releasex86" description="build releasable version" if="$
{x86_supported}">
  <exec executable="$ {msbuild.directory}\msbuild.exe" dir="."
failonerror="true" >
    <arg line="$ {project.name}.sln /m /nologo /t:build
/p:Configuration=&quot;Release&quot; /p:Platform=win32" />
  </exec>
</target>

<!-- X64 -->
<target name="releasex64" description="build releasable version" if="$
{x64_supported}">
  <exec executable="$ {msbuild.directory}\msbuild.exe" dir="."
failonerror="true" >
    <arg line="$ {project.name}.sln /m /nologo /t:build
/p:Configuration=&quot;Release&quot; /p:Platform=x64" />
  </exec>
</target>

<target name="release" description="build releasable version">
  <antcall target="releasex86" />
  <antcall target="releasex64" />
</target>

<!-- TEST -->

<!-- X86 -->
<target name="testx86" description="test version" if="$ {x86_supported}">
  <exec executable="$ {basedir}\$
{project.root}\bin\release\x86\ToolPEtoHXE.exe" dir="$ {basedir}\Win32\Release"
failonerror="true" >
    <arg line="$ {project.name}.dll $ {project.name}.hxe" />
  </exec>

```

```

</target>

<!-- X64 -->
<target name="testx64" description="test version" if="{x64_supported}">
  <exec executable="{basedir}\$
{project.root}\bin\release\x64\ToolPEtoHXE.exe" dir="{basedir}\x64\Release"
failonerror="true" >
  <arg line="{project.name}.dll {project.name}.hxe" />
</exec>
</target>

<target name="test" description="validate project">
  <antcall target="testx86" />
  <antcall target="testx64" />
</target>

<!-- PUBLISH -->

<target name="publishx86" if="{x86_supported}">
  <copy file="Win32/Release/{project.name}.dll" tofile="{
{project.root}/bin/release/x86/{project.name}.dll" overwrite="true"
failonerror="true"/>
  <copy file="Win32/Release/{project.name}.hxe" tofile="{
{project.root}/bin/release/x86/{project.name}.hxe" overwrite="true"
failonerror="true"/>
  <copy file="Win32/Release/{project.name}.lib" tofile="{
{project.root}/lib/x86/{project.name}.lib" overwrite="true" failonerror="true"/>
  <copy file="Win32/Debug/{project.name}.dll" tofile="{
{project.root}/bin/debug/x86/{project.name}.dll" overwrite="true"
failonerror="true"/>
</target>

<target name="publishx64" if="{x64_supported}">
  <copy file="x64/Release/{project.name}.dll" tofile="{
{project.root}/bin/release/x64/{project.name}.dll" overwrite="true"
failonerror="true"/>
  <copy file="x64/Release/{project.name}.hxe" tofile="{
{project.root}/bin/release/x64/{project.name}.hxe" overwrite="true"
failonerror="true"/>
  <copy file="x64/Release/{project.name}.lib" tofile="{
{project.root}/lib/x64/{
project.name}.lib" overwrite="true" failonerror="true"/>
  <copy file="x64/Debug/{project.name}.dll" tofile="{
{project.root}/bin/debug/x64/{project.name}.dll" overwrite="true"
failonerror="true"/>
</target>

<target name="publish" description="copy solutions files to distribution
directory">
  <parallel>
    <antcall target="publishx86" />

```

```

    <antcall target="publishx64" />
  </parallel>
</target>

<target name="clean" description="remove all generated files">
  <delete failonerror="false" >
    <fileset dir="." >
      <include name="**/build*.log" />
      <include name="**/*.suo" />
      <include name="**/*.ncb" />
      <include name="**/*.user" />
      <include name="**/*.err" />
      <include name="**/*.cache" />
      <include name="**/*.Int" />
      <include name="**/*.aps" />
      <include name="**/*.log" />
      <include name="**/*.wrn" />
      <include name="**/*.sdf" />
    </fileset>
  </delete>
  <delete dir="ipch" failonerror="false" />
  <delete dir="symsrv" failonerror="false" />
  <delete dir="symsrv.dll" failonerror="false" />
  <delete dir="win32" failonerror="false" />
  <delete dir="x64" failonerror="false" />
  <delete dir="config" failonerror="false" />

  <delete file="\${project.root}/bin/release/x86/\${project.name}.dll"
failonerror="false" />
  <delete file="\${project.root}/bin/release/x86/\${project.name}.hxe"
failonerror="false" />
  <delete file="\${project.root}/lib/x86/\${project.name}.lib" failonerror="false" />
  <delete file="\${project.root}/bin/debug/x86/\${project.name}.dll"
failonerror="false" />

  <delete file="\${project.root}/bin/release/x64/\${project.name}.dll"
failonerror="false" />
  <delete file="\${project.root}/bin/release/x64/\${project.name}.hxe"
failonerror="false" />
  <delete file="\${project.root}/lib/x64/\${project.name}.lib" failonerror="false" />
  <delete file="\${project.root}/bin/debug/x64/\${project.name}.dll"
failonerror="false" />
</target>

<target name="all">
  <antcall target="debug" />
  <antcall target="release" />
  <antcall target="test" />
  <antcall target="publish" />
</target>

```

```

<target name="lazy">
  <parallel>
    <antcall target="debug" />
    <antcall target="release" />
  </parallel>
  <antcall target="publish" />
</target>
</project>

```

Boot Persistence

There must be a way to execute as a service that will be allowed access to the internet. One way would be to add a new service and update the firewall to provide external access. Another way would be to create a new srvice service that resides in Network or Local Service group. Each of these techniques are easily enumerated via the service control manager/service registry keys and process explorer. A better approach may be to extend the functionality of an existing service that resides in a service group that will allow beacon/transport features.

Method 1: Hijack DNS srvice

```

HKLM\SYSTEM\CurrentControlSet\Services\Dnscache\Parameters\ServiceDll
  Original: %SystemRoot%\System32\dnssrslvr.dll
  Target: %SystemRoot%\System32\dnsclnt.dll

```

NOTE: This new dll will take over the functionality of the original dll by forwarding existing function to the original and loading the engine into memory during the call to dllman. A benefit of forwarding and not proxying is that the DLL can be unloaded dynamically without interfering with normal processing. The problem with unloading is that the server may do a GetProcAddress on the module that is no longer loaded. This situation would need to be tested for uninstall to work properly.

The following is the .def file required to create a forwarding dll. It is required to create some stub functions that are local to ensure that PSP do not detect the forwarding heuristic.

.def file

```
LIBRARY dnsclnt
```

```
EXPORTS
```

```

  LoadGPEExtension=dnssrslvr.LoadGPEExtension           @1
  Reg_DoRegisterAdapter= dnssrslvr.Reg_DoRegisterAdapter @2
  ServiceMain=dnssrslvr.ServiceMain                   @3
  SvchostPusServiceGlobals=dnssrslvr.SvchostPusServiceGlobals @4

```

Method 2: sudo-hijack DNS srvice

```

HKLM\SYSTEM\CurrentControlSet\Services\Dnscache\Parameters\extension
  Original: %SystemRoot%\System32\dnsexst.dll
  Target: %SystemRoot%\System32\Microsoft\DNS\dnsexst.dll

```

This approach works because the full path for a specific component is stored in the registry. By changing the path, in this case the path can be anywhere but

UNCLASSIFIED//FOUO

system32, the service will load the target code and the target code will load the original dll using the full path to system32. Our dnsextdll module can be dynamically unloaded at startup time because nothing references it. The only problem may be a timing issues on the dnsextdll service if it has dependencies with the host.

UNCLASSIFIED//FOUO


```

    UCHAR bReserved[4];
    PVOID pMutant;
    PVOID pImageBaseAddress;
    PPEB_LDR_DATA pLdr;
} PEB, *PPEB;
#else
typedef struct tagPEB
{
    UCHAR bInheritedAddressSpace;
    UCHAR bReadImageFileExecOptions;
    UCHAR bBeingDebugged;
    UCHAR bSpareBool;
    PVOID pMutant;
    PVOID pImageBaseAddress;
    PPEB_LDR_DATA pLdr;
} PEB, *PPEB;
#endif

```

On Demand Loading

It should be possible to decrypt everything at runtime on-demand. Only the engine would need to be in the clear in RAM while the tool is running. Dynamically load the beacon code when the beacon must be called. The same for uninstall. This would reduce the in-memory foot print.

Data Persistence

Most targets rely on the data being processed from within the host executable. This type of tool can be sent to the cloud and processed without requiring a secondary file. By placing target code (beacon/transport/uninstall) in the data area, forces reverse engineers to explore one additional hop to process while reviewing the inner workings of the tool. This means that data persistence module has code blocks and configuration data.

- Beacon (NOTE: engine will be embedded within the host.dll)
- Transport
- Uninstall
- Config
- DynConfig - dynamic data at the end of this file or in registry.

DATA LOCATION: c:\windows\system32\codeintegrity\dns.cache (masked/encrypted binary file)

Encryption

All data and communications must be encrypted. The simplest approach would be to support AES 256 via crypto api and specifically binding directly to bcrypt.dll. NOTE: bcrypt.dll does not exist on XP so this implementation would only work on > XP platforms (shouldn't be an issue).

Compression

This is more of an optional selection. By including this as a basic capability of the engine, we would be able to compress content being processed by the transport (exfil/loading). It may be easiest to use zlib or bzip.

Hashing

To obfuscate function names, each name will need to be hashed using Adler32. This code resides in the open source zlib library.

Coding Standard

- C/C++: Tab size = 3 Insert spaces (no tabs)
- Python: Tab Size = 4 Insert spaces (no tabs)
- Visual Studio 2013 with PTVS(python plugin)
 - o Do not create directory for sln (in same directory with source)
 - o Do not create pre/post build tasks (use ant to describe build)
- Python 3.4 x86\x64
- Linux - Ubuntu?
- Every module has a test harness (cppunit/googletest/custom)
- Doxygen supported comments

Headers:

```
// *****
/// @file      Engine.cpp
/// @brief     This modules contains the engine code.
/// @date      April 20, 2015
// *****
```

Functions:

```
// *****
/// @brief     This function will hash the buffer.
/// @param [in] pBuffer - pointer to buffer to hash
/// @param [in] dBufferSize - size of the buffer
/// @return    hash
// *****
```

Footers:

```
// //////////////////////////////////////
```

```
// END Engine.cpp
// ///////////////////////////////////////////////////////////////////
```

Installer

- Obfuscate function calls
- Use ExpandEnvironmentStrings for all UTF8 encoded string from configuration
- Create directory if path does not exist - SHCreateDirectoryEx or similar
- Ensure system can uninstall .dll and .dat files by setting ACL for installed files (e.g. SDDL_NETWORK_SERVICE) - may be able to do this at uninstall time
- Ensure system can uninstall registry keys by setting ACL for registry - may be able to do this at uninstall time
- SCM - stop/start/query
 - o Set service to autostart
 - o Remove SCM trigger on service (*ChangeServiceConfig2*)

Listening Post (Python)

The server is implemented as a python script running on Centos?? (will also work on Ubuntu and Windows). The server must support a RESTful interface that can receive files and transmit files via HTTPS. To create a new interface, it is recommended to use bottle/cherrypy/pyopenssl for this low side tool.

Bottle - bottlepy.org - provides a simple stackless/WSGI interface for Apache
 CherryPy - provides a minimalist python web framework
 Pyopenssl - provides ssl support

Configuring Apache

http_proxy

Configuring IIS

Microsoft IIS requires additional support packages to install ARR and UrlRewriter. Install the following components for the platform you are using.

Install Web Platform Installer

WebPlatformInstaller_3_10_amd64_en-US.msi

WebPlatformInstaller_3_10_x86_en-US.msi

Install Web Farm

WebFarm2_x64.msi

WebFarm2_x86.msi

Install Microsoft's Application Request Router (ARR)

requestRouter_x64.msi

requestRouter_x86.msi

Install Url Rewriter

rewrite_2.0_rtw_x64.msi

rewrite_x86_en-US.msi

Once the UrlRewriter is installed, bring up IIS and view the site that you want to update with this new feature. The UrlRewriter creates a tool in the IIS section of the web site called "URL Rewrite". If you see this icon, you have installed the required components. You can double click the icon and create a proxy component. (e.g. <http://weblogs.asp.net/owscott/creating-a-reverse-proxy-with-url-rewrite-for-iis>) Alternately, simply create a file called web.config in the default web site location. On my box, this directory is "C:\inetpub\wwwroot". The following configuration will intercept any url request with the name "lp" in the name and redirect it to 127.0.0.1:5000. The name lp can be thought of as a virtual directory in the IIS directory tree and everything after the word "lp" is copied to the new address that proxies the SSL request from HTTPS to HTTP on a different port and/or machine.

C:\inetpub\wwwroot\web.config

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
  <system.webServer>
    <rewrite>
      <rules>
        <rule name="ReverseProxyInboundRule1" patternSyntax="Wildcard"
stopProcessing="true">
          <match url="octopus/*" />
          <action type="Rewrite" url="http://127.0.0.1:5000/{R:1}"
logRewrittenUrl="true" />
        </rule>
      </rules>
    </rewrite>
  </system.webServer>
</configuration>
```

Now that IIS is configured properly, you need to setup and run the lp web service. There is no change between lp on Linux and Windows. You still need to configure an input and output directory. It may be easiest to create a batch file to configure the server. The following command uses an input and output directory on d:\lp and calls the python code from the code tree. The port option of 5000 is selectable but must be that same as the port specified in IIS (see above).

Sample Batch File/Command Line

```
python D:\Development\athena\console\listeningpost\server.py -i d:\lp\input -o
d:\lp\output -l 0.0.0.0 -p 5000 -s -debug
```

Builder (Python)

The installer build tool will be run from the high side. All strings will be stored in UTF8. All names will be the same in code as well as the xml file. The build code will provide three functions:

- Config - configuration of the target
- Manager - generate installer dll/bin/etc. files for target
- Wizard - {optional} step-by-step interface to walk through configuration

The following list shows additional requirements.

- Configuration will be stored in XML format
- Command line inputs managed via argparse
- Crypto - must use openssl.py
- Try not to use python/pefile.py as part of build (used for testing is OK)

NOTE: The following explains the method to create a server side cert.

```
openssl genpkey -algorithm RSA -out a.key
openssl req -new -key a.key -out a.req -subj /CN=10.3.2.111
openssl x509 -req -in a.req -signkey a.key -out a.cert
```

Naming Python (match names in Athena header to names in python dictionary)

```
{
    "TARGET" : { "ID" : None,
                "KEY" : None,
                "IV" : None,
                "DYN_CONFIG_TYPE" : str(0),
                "DYN_CONFIG_PATH" : None },
    "BEACON" : { "INTERVAL" : str(60*60*24),
                "JITTER" : str(5),
                "BOOT_DELAY" : str(60),
                "HIBERNATION_TIME" : str(60),
                "TASK_DELAY" : str(60),
                "SERVERS" : None,
                "PORT" : str(80),
                "PROXY_PORT" : str(0),
                "PROXY_ADDRESS" : str(0),
                "USER_AGENT_STRING" : "Mozilla/0.4" },
    "TASKING" : { "FILE_PROCESSING_PATH" : None,
                "BATCH_EXECUTION_TIMEOUT" : None,
                "COMMAND_EXECUTE_TIMEOUT" : None,
                "MAX_KBPS_THROUGHPUT" : None,
                "MAX_CPU_UTILIZATION" : None,
                "MAX_PROCESSING_DATA_SIZE" : None },
    "UNINSTALL" : { "DATE_AND_TIME" : str(0),
                   "DEAD_MAN_DELAY" : str(0),
                   "BEACON_FAILURES" : str(0),
                   "KILL_FILE_PATH" : None },
    "INSTALL" : { "ORIGINAL_FILE_NAME" : "%SystemRoot%\System32\dnsrslvr.dll",
                  "TARGET_FILE_NAME" : "%SystemRoot%\System32\dnsclnt.dll",
                  "DATA_FILE_NAME" : "%SystemRoot
%\\system32\\codeintegrity\dns.cache " },
}
```

C Struct - Hungarian notation

```

typedef struct tagAthenaConfig
{
    struct
    {
        ULONG dID; // dword - config ID - generated by python for
        ULONG dKey; // buffer - aes key - 32 bytes
        ULONG dIV; // buffer - aes iv - 16 bytes
        ULONG dDynConfigType; // dword - ATHENA_DYNCONFIG_TYPE_XXX
        ULONG dDynConfigPath; // string - location of dynamic config data
    } Target;

    struct
    {
        ULONG dInterval; // dword - frequency - how often to beacon in
        ULONG dJitter; // dword - % of frequency to alter beacon timing
        ULONG dBootDelay; // dword - initial delay after boot before any
        ULONG dHibernationTime; // dword - initial time to wait after install
        ULONG dTaskingDelay; // dword - amount of time between receiving
        ULONG dServers; // string list of server domain names (DNS) or ip
        ULONG dPort; // dword - specific port used to communicate
        ULONG dProxyPort; // dword - proxy port number - 0 means do not use
        ULONG dProxyAddress; // dword - ip address - 0 means do not use
        ULONG dUserAgentString; // string - user agent string
    } Beacon;

    struct
    {
        ULONG dFileProcessingPath; // string - path used for default file processing
        ULONG dBatchExecutionTimeout; // dword - specific amount of time when the batch
        ULONG dCommandExecutionTimeout; // dword - specific amount of time when the
        ULONG dMaxKBPSThroughput; // dword - maximum kilobytes per second throughput
        ULONG dMaxCpuUtilization; // dword - maximum percentage of cpu utilization
        ULONG dMaxProcessingDataSize; // dword - maximum amount of data processed during
    } Tasking;

    struct
    {
        ULONG dDateAndTime; // time - specific time to uninstall
        ULONG dDeadManDelay; // dword - amount of time to delay until uninstall
        ULONG dBeaconFailures; // dword - number of failed beacon to allow before
        ULONG dKillFilePath; // string - location of the kill file
    } Uninstall;
} ATHENA_CONFIG, *PATHENA_CONFIG;

```

Engine

The engine contains all the common functions. It would reside with the host file and have intimate knowledge about finding the data file. It should expose common functions required by sub-components.

- Athena_Hash - calculate Adler32 from buffer
- Athena_Crypto_Encrypt - encrypt buffer
- Athena_Crypto_Decrypt - decrypt buffer
- Athena_Compress - compress data zlib
- Athena-Decompress - decompress data zlib
- Athena_Random - randomize buffer
- Athena_Package_Get - retrieve data
- Athena_Package_Set - set config data
- Athena_Package_Close - called by uninstaller
- Athena_Config_Get - retrieve element (keep encrypted in ram unless being used)
- Athena_Config_Set - only write to dyn_config data
- Athena_Load - load a dll or exe
- Athena_Unload - unload a dll or exe
- Athena_malloc - allocate memory (centralized memory management)
- Athena_free - free memory
- Athena_memset - (vs - intrinsics)
- Athena_memcpy - (vs - intrinsics)

C Runtime

Do not statically bind the c runtime to any module. Athena will bind to MSVCRT to allow exception handling and c++ features. Microsoft has changed MSVCRT in different builds of the operating system. We have found that WINDDK\2600\lib\w2k\i386 and WINDDK\3790.1830\lib\crt\amd64 to work best.

NOTE: Visual Studio must be configured to use Configuration Properties\General\Platform Toolset: Visual Studio 2013 - Windows XP(v120_xp) to cause the least amount of compilation anxiety.

Packager

File Packager - thought CAB would be fun but now it may be better to create a simple static file manager. Simply mask offset/size - encrypt content

offset/size - beacon.dll

offset/size - unload.dll

offset/size - config (static config)

{offset/size} - dynamic config (default location) - may be in here/alternate file/registry

Athena_Package_Get(ATHENA_PACKAGE_XXX, pBuffer, &dBufferSize)

ATHENA_PACKAGE_BEACON

ATHENA_PACKAGE_TRANSPORT

ATHENA_PACKAGE_UNLOAD

ATHENA_PACKAGE_CONFIG (default) - what about config location?

ATHENA_PACKAGE_DYN_CONFIG

Athena_Package_Set(ATHENA_PACKAGE_DYN_CONFIG, pBuffer, dBufferSize)

Dyn_config can only be written
Athena_Package_Close(); - called by uninstaller

Offline

* Option 1: update actual registry / files (problem is ACLs not updated and uninstall may fail)

Option 2: HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnce\!Installer.exe
(requires registry change)

Option 3: overload a service dll that is always running?

* Option 4: set a schedule -

c:\windows\system32\tasks\microsoft\windows\xxx\xmlfile
(no registry change maybe)

Option 5: boot exec - write native api exe - this may actually need to be signed
(requires registry change)

Option 6: app init?
(requires registry change)

Virtual Disk Development Kit (VDDK) from VMWare

vmware-mount Z: a.vmdk /v:1 (mount volume to drive K:)

vmware-mount Z: /d /f (dismount volume)

Live Server CD Ubuntu - autorun our command line tool - no desktop / no login

MENU:

- 1 \dev\sda1 - Hard Disk 1 (use hex 1..F - to get 15 max partitions)
- 2 \dev\sda2 - Rescue Disk
- X Exit to Shell
- S Shutdown

Enter selection: 1

Processing \dev\sda1 - Hard Disk 1

Completed Successfully

{rerun menu}

Documentation must contain Instructions for building USB image (perhaps python script)

Offline Update:

- 1) Mount volume
- 2) File System: copy {drive}\windows\system32\dnsclnt.dll
 - a. {Windows} - duplicate security from dnssrslvr
 - b. Update create\modify\last update dates
- 3) Registry: replace "dnssrslvr.dll" -> "dnsclnt.dll" - is this enough
 - a. (maybe) ensure the service is autorun / no triggers?
- 4) Dismount volume

Use Bart PE with Windows Server 2003 for Windows offline

UNCLASSIFIED//FOUO

Question: can pebuilder be scripted in the build?
User TinyCore for Linux offline disk
Question: can this be scripted on a linux instance?

UNCLASSIFIED//FOUO

Questions

4.5.1.2/4.5.2.2 – does incremental file upload mean that there is a max upload size per beacon? Or is this simply an ability to restart where it left off.

4.5.1.7&8 – non blocking exfil – does this mean we should support multiple file/command transfer threads/connections on target (alternatively, a single thread/connection would mean blocking?)

4.10.2.3 – can we harvest the proxy credentials during install?

Just address and port of base or do we also need to drill down to advanced settings within IE?

4.10.2.6 – can we harvest the user agent string during install?

4.10.7.5 – is asymmetric the right word here – meaning RSA instead of AES 256

4.13.1.1.1 – if we are running as system does Athena still need to support launching as the current user

or can we only support this when run within a user context?

4.13.1.1.2 – The dynamic loading of a static/non-dynamic exe is problematic in the address space of the

existing host application. If the exe is dynamic, it may still fail depending on import

dependencies. This requirement cannot be performed without restricting the exe to ones that

have been tested with the framework. My initial guess is that there would be a very small

number of off-the-shelf tools that would work. (NOTE: I have tested psexec.exe and this tool

would fail without creating an application execution virtualization environment custom to the

executable in question.)

4.13.2.1 – does this mean we need to create the following deliverables

installer.exe/installer.dll/installer.bin

run.exe/run.dll/run.bin – non persistent (everything occurs in ram)

4.16.6 – can we use UTF8 internally (python) and convert this to unicode/expanded on target?

4.17.1 – can we use python bottle (Apache supported WSGI framework) instead of CGI on linux lp?

4.19 – Does this mean you want 4 deliverables (which linux distro?)

offline_win_x86.exe/offline_win_x64.exe/offline_linux_x86/offline_linux_x64

4.19.1 – Note: we will not be able to support encrypted or bios locked systems.

4.19.2.1 – can we use Bart PE? Will customer give us a Windows Server 2003 Standard Edition or Win XP

SP3 installation disk to use for hosting the PE image? (licensing issue)

4.19.2.2 – what linux OS(Ubuntu/Centos) did you want us to target? Can we use tinycore (10BM)?

4.19.2.2 – will customer be supplying a windows registry library for linux or do we use hivexsh, etc.?

Command Question:

What is the idea behind of pre/post execution delay – instead of just an inter-command delay?

Exec:

Srvhost cannot access foreground desktop due to os restrictions.
Does this command execute programs exclusively or shell commands as well? If cmd, we may want a CMD command or just tell the users to use "cmd /C".

Get:

Command needs dword offset/size to support 4.5.1.4/4.5.2.4.
What does override flag do for the GET command?
Is dword 4GB enough for files?
Is there any way to get a file listing except via cmd?
What happens if a directory is selected?

Put:

Command needs dword offset to support 4.5.1.4/4.5.2.4.
Is dword 4GB enough for files?
What happens if the file already exists (overwrite?)
What happens if the file refers to a directory?

Memload:

Is nickname really what you want to transmit or is an internal memload ID enough and the server views the user "nickname" on the backend?
Does this command only support nod persistent dlls or pic or axe as well?

Memunload:

Should probably remove nickname and just have an internal memload ID.

Set:

BYTE ATHENA_CONFIG_TYPE_XXX (dword/time/string/stringlist/buffer)
ULONG value (dword/time)
or
ULONG size (string/stringlist/buffer)
UCHAR buffer

Is there a way to delete the dynamic value and reset to default?
Is there a way to disable the setting to override the default but make it inactive? Most values of 0 are inactive.

Uninstall:

Should this command at least respond saying that the command has been received?

Schedule Tasking

Complete development in 3 months - internal test/dart at customer

Tasking for Aug 24:

- Configure environment
 - VS/ANT/DOXYGEN/vmware workstation/vmware-mount/pebuilder/tinycore
- Complete Schedule
- Complete Design (engine/builder/server)
- Complete PIR
- Start SRR(RVTM) / DR (do these at the same time)
- Test Procedures (living document)
- Evaluate Windows Boot CD - Bart PE - Windows Server 2003 - Standard
- Evaluate Live CD - TinyCore

GOAL - working prototype in 2 months - end of OCT.

Target (2 months including loader) - C code

- Install (1 week) - including ACL updates
- uninstall (1 week) - validate in context of system
- beacon (1 week) - winhttp/urlmon/wininet
- command (1 week) - command parser
- engine (self loading) (2 weeks)
- host (1 week)
- (1 week - create tools/automated tests for each one)

Console (2 months including server) - Python code

- builder (build target) - 2 weeks (XML/openssl) - must be first(needed by target)

- listeningpost (bottle/cherrypy/pyopenssl - https file server) - 2 weeks
- command interface management (HOW?)
- parser - decode responses and beacon history - 2 weeks
- tasker - encrypt files / messages to target - 2 weeks

Offline - 2 weeks

- lin (this directory is copied from linux build environment)

- athena_offline

- x86

- x64

- win

- athena_offline

Tests - 1 month

- Unit tests - for every command / module
- Full psp testing
- Dart scripts

Documentation - 1 week

XXXXX Tasking:

Validate bottle
Configure apache
Bart PE
Tinycore

Pycparser
Cffi
foolscap

pycrypto
pyasn1

Cryptography
Cffi
Pycparser