

ProductNAME
Functional Specifications Collection
and Estimate



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ProductNAME
Functional Specifications Collection
and Preliminary Estimate

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Overview

This document presents:

- 1 An analysis and estimate of the time necessary to collect complete functional specifications for the ProductNAME 64 TIFF printer driver.
- 2 A preliminary analysis and estimate of the time required to develop the ProductNAME 64 TIFF printer driver

Original Requirements

Reference Documents

Title	Rev	Date	File Name
Requirements Analysis	2.0	11 Dec 2008	TIFF Printer Driver Requirements v2.doc

Existing Requirements

Several features are already implemented in the existing ProductNAME 32-bit version. Analysis of functional specifications for these features assumes that the 64-bit version will implement these features in a substantially similar manner.

R02	full support for internationalization (first English, German, later maybe French, Spanish, ...)
R03	full support for printer sharing and update (by installer and as shared printer), also in terminal server environments
R05	must allow several instances of the driver with separated settings
R06	support for restriction of the modification of extended settings based on windows group membership
R09	allows to produce Tiff files in different flavors as well as additional graphic formats, like jpg, bmp, gif, selectable by option tab in extended printer driver settings:
R10	Single or multipage Tiff Files
R11	plain, striped or tiled formats with different stripe or tile sizes
R12	different compression schemas
R13	support for anisotropic fax formats (monochrome, G3 compression, 96 x 203(?) and ??? dpi
R14	inclusion of user information in extended tiff tags
R15	monochrome, grayscale or different color depth images
R16	different paper forms and resolutions, from 75 dpi up to 1800 dpi
R17	monochrome and color printer mode
R24	output to device port and/or (user selectable) file
R25	filename generation supporting different macros (file name from printing application with different filters, ascending numbers, date, user, login name,

	fixed strings, ...)
R26	possibility to define regular expression using filters for the filenames given from the printing application
R27	watch out for the system where the rendering takes place if used as a shared printer
R28	API for post processing by calling an application that will perform further operations, e.g. stamping with the created file
R29	optional “save as” dialog (for Pro subversion), hopefully supporting terminal server environments.
R30	optional watermarks, stamps, label printing
R31	there must be support for an accompanying product (directCONTROL64) which allows the control of the ProductNAME 64 printer driver from other applications (API), see existing directCONTROL.

Partially Implemented Requirements

The following features are partially implemented in the 32-bit system. Some additional work may be necessary to create detailed functional specifications.

R04	full support for unattended setup (text style feature describing configuration file) and Windows style inf-file setup (only inf-style setup already implemented)
R18	support for large formats (up to larger than A0, e.g. 2m x 16m), limits may be introduced by the tiff or respective graphics format (maximum files size/paper format memory-limited)
R32	The software must comply with the Client Company Software Building Guidelines. See for documentation and error logging especially (error logging only to Windows Event Log)

New Requirements

These requirements are not implemented in the current version. More detailed functional specifications will be required.

R01	integrates into Microsoft Operating Systems for 64bit x86 architecture as printer driver
R07	feature subsets (product subversions) selectable by license system (lite, std and pro version)
R19	full large file support on poor memory equipped machines

Phase II Requirements

These requirements will not be included in the first phase of the ProductNAME 64. These requirements are analyzed and estimated separately in this document.

R08	support for license restrictions based on number of uses per time unit (e.g. 10 conversions/day, 100 per week)
R20	post process color reduction, that means, the printer driver presents as color printer driver to the application, but can reduce the color depth to even 1 bit black/white afterwards
R21	selection of different paper formats, including the possibility to define “non-printable” edges, what finally gives the opportunity to define the output file size exactly to n by m pixels
R22	introduction of custom forms into windows printing system
R23	nice to have: predefined additional paper forms (for OEM Version builds)
R30	optional watermarks, stamps, label printing

Functional Specifications

The functional specifications determinable from the requirements must be documented, and additional functional requirements must be collected. This process is estimated to take 5-6 days.

<i>Issue</i>	<i>Time (days)</i>	<i>Req</i>
Requirements and Specifications	5.40 d	
Install and configure 32-bit ProductNAME	1.00 d	
General printing requirements	0.50 d	
Describe configuration options	0.10 d	R04
Discover settings from 32-bit; describe all new settings	0.25 d	R06
Determine specific feature subsets by license level	0.25 d	R07
Specify all supported flavors/formats	0.25 d	R09
Specify all supported compression schemas	0.25 d	R12
Determine all applicable anisotropic fax formats	0.10 d	R13
Determine which user information to include	0.10 d	R14
Determine specified macro/formats	0.25 d	R25
Determine what information differs based on rendering location	0.10 d	R27
Specify Post-Processing API	1.00 d	R28
Document existing directCONTROL functionality	1.00 d	R31
R5, 10, 11, 15-19, 24, 26, 29, 32	0.25 d	

Project Analysis

Objective

ProductNAME is a Windows Tiff printer driver that generates Single- and Multi-paged TIF files from each Windows application.

The ProductNAME 64 driver will convert print output to TIFF files. ProductNAME 64 will be integrated with the system core and can be used from all standard Windows applications that use standard windows form for choosing the necessary printer.

Key Features

- 1 Generates TIFF files from every Windows application that supports printing
- 2 Fast conversion (native 64-bit kernel-level printer driver)
- 3 Generates compatible single-paged and multi-paged TIFF files as well as other formats
- 4 Printing in monochrome with or without half-toning and in color
- 5 The driver will also generate JPEG, BMF, GIF, PCX and DCX formats

Modules

ProductNAME 64 will consist of the following modules:

Printer driver	Implements all respective functions for interacting with the system kernel.
Image Manipulation	Generates and manages graphical output in the required formats
Printer module	Directs application print output to the established graphical formats with specified preferences
GUI	Allows users to set driver properties, adds new printers and manages licenses
directCONTROL64	Allows control of the driver from other applications using an API
HTML Help	Documents and describes the ProductNAME 64 and directCONTROL64 applications
Installer	Installs all deliverable components to the user's computer

General Constraints

These are general constraints for the development process:

- 1 ProductNAME 64 will be developed in the C++ programming language
- 2 ProductNAME 64 user interface elements will resemble the existing 32-bit ProductNAME driver

- 3 ProductNAME 64 must support 64-bit Windows operating systems

Preliminary Estimate

Assumptions

- 1 Functional specifications
- 2 Existing source code
- 3 Image manipulation library

Functional Specifications

This estimate reflects assumptions about unspecified functional specifications. If the final functional specifications prove less complicated than assumed, the estimated time to complete the project may be reduced.

Existing Source Code

This estimate assumes that the source code for the existing 32-bit ProductNAME project will be available to the development. Per the requirements ProductNAME 64 will be a “from-scratch” development effort; it is expected, however, that the existing source code save considerable time. If the original source code cannot be provided, additional time will have to be added to the estimate.

Image Manipulation Library

This estimate assumes that almost all direct image manipulation can be performed using a 3rd party library. A detailed investigation of image manipulation libraries to compare their capabilities with the final functional specification is included in the estimate.

Phase I

Total time for Phase I: **195.25 days**

<i>Task</i>	<i>Time Req (days)</i>
Phase I Total	195.25 d
Design	15.00 d
Architecture and high-level design	10.00 d
Evaluate image manipulation libraries	5.00 d
Development	126.25 d
Core GUI Development	
Extended properties dialog	4.00 d
License management dialog	3.00 d
Other dialogs	3.00 d

Core Driver Development		
Core printer driver	28.00 d	R01
Printer sharing and terminal server support	15.00 d	R03
Multiple driver instances	2.00 d	R05
Output to device port and/or (user selectable) file	7.00 d	R24
Internationalization	1.00 d	R02
Additional Features		
Multiple file formats	2.00 d	R09
Single- or multi-page tiff files	0.50 d	R10
Plain, striped or tiled formats with different stripe or tile sizes	1.00 d	R11
Different compression schemas	1.00 d	R12
Support for anisotropic fax formats	0.25 d	R13
Inclusion of user information in extended tiff tags	0.50 d	R14
Monochrome, grayscale or different color depth images	2.00 d	R15
Different paper forms and resolutions	0.50 d	R16
Monochrome and color printer mode	0.50 d	R17
Support for large formats	0.50 d	R18
Full large file support on poor memory equipped machines	5.00 d	R19
Filename generation	2.00 d	R25
Regular expression filters	3.00 d	R26
Differential rendering by source	3.00 d	R27
Post-processing API	10.00 d	R28
Optional “save as” dialog	0.50 d	R29
Optional watermarks, stamps, label printing	4.00 d	R30
Feature subsets by license	2.00 d	R07
Control extended settings	2.00 d	R06
directCONTROL64 development	15.00 d	R31
Additional time for incomplete requirements	8.00 d	
Post Development	54.00 d	
Testing and Documentation		
Testing	44.00 d	
Documentation	5.00 d	
Installation		
Installer package implementation	3.00 d	
Unattended setup	2.00 d	R04

Phase II

Total time for phase II: **34.80 days**

<i>Task</i>	<i>Time (days)</i>	<i>Req</i>
Phase II	34.80 d	
Planning		
Specify parameters	0.10 d	R08
Can use post-production API per R28	0.10 d	R20
Specify required parameters	0.10 d	R21
Need full functional description	1.00 d	R22
Specify pre-defined forms	0.25 d	R23
Specify supported formats, content and styles	0.25 d	R30
Development		
Design	3.00 d	
Users per time by license	3.00 d	R08
Post process color reduction	2.00 d	R20
Selection of different paper formats	3.00 d	R21
Introduction of custom forms into windows printing system	5.00 d	R22
Predefined additional paper forms	7.00 d	R23
Post Development		
Testing and documentation		
Testing	8.00 d	
Documentation	2.00 d	