



Wide Area GroupFlow System®

Installation Guide for the Wide Area GroupFlow System (WAGS)

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1 General description

The Wide Area GroupFlow System (WAGS) is an experimental workflow management system, aimed at demonstrating features for Wide Area Workflow Management (WAWM). The concepts for WAWM underlying WAGS are described in:

Gerold Riempp: Wide Area Workflow Management – Creating Partnerships for the 21st Century, Springer Verlag, Berlin etc., 1998 (ISBN: 3-540-76243-4).

To use WAGS, you need to understand the concepts and practical examples described in this book in order to benefit from the installation and use of WAGS. The author doubts that it is possible to create workflow models for *wide area workflows* without this understanding.

WAGS consists of a runtime engine based on Lotus Notes™ and several graphical tools that help to plan workflow models and to monitor and analyze workflow instances.

2 System requirements

The Wide Area GroupFlow System has been developed on the basis of Lotus Notes™ and cannot be run without it. The following hard- and software is required:

1. Client application and graphical tools:

- An IBM-compatible PC with a 486 processor or higher
- 32 MB RAM or more
- Color display with a resolution of 800x600 or more
- 40 MB free hard disk space

- Microsoft Windows 95™, Version “b” (if you use earlier versions, please install the MS Internet Explorer 3.0 or later in order to upgrade your system)
- Lotus Notes™ 4.6 client software or later

2. Server application:

- Lotus Notes Domino™ 4.6 server with 64 MB or more

Furthermore, if you want to run WAGS on a Lotus Notes™ server, you should be familiar with database and server administration tasks such as user registration, adjustment of ACLs, assigning agents to server for execution, granting rights to server-based agents, set-up of mail-in databases etc.

For running the client application only, you should be familiar with using Lotus Notes™ databases so that you can add databases to your *workspace*, open databases, select *views*, fill-out *forms* and use the *action bar* etc.

If you do not own an installation of Lotus Notes™, the only thing you can do is watch the ScreenMovies that were recorded to illustrate the use of WAGS.

3 Installation programs

WAGS is installed with two installation programs:

1. The first installation program (called “main installation”) brings the WAGS Modeler and the different WAGS databases to your hard disk.
2. The second installation program additionally installs the WAGS Analyzer. This tool is not needed for the fundamental functions of WAGS.

3.1 Main installation program

Run the “WAGSmain.exe” to de-compress the installation files. Start the “Setup.exe” program and follow the instructions.

After you have successfully completed the installation, do the following:

In order to run the graphical tools of WAGS, have to indicate the path of your Lotus Notes™ program directory. To do this, add the following statement to the “autoexec.bat” file, which is located in the root level of the hard disk your PC boots from:

```
PATH C:\PROGRA~1\NOTES
```

where “C:\PROGRA~1\NOTES” stands for the location of your Lotus Notes™ program directory.

Please note that this statement has to be written in the 8-digit notation of MS DOS, so that for instance the path “C:\program files\Notes” in Windows 95™ must be abbreviated with “C:\PROGRA~1\NOTES” in the statement included in the “autoexec.bat” file.

After you have included the statement, shutdown and re-start your PC. Now the graphical tools should be able to locate the Lotus Notes™ program directory to make use of certain program files to access the different Lotus Notes™ databases of WAGS.

3.2 Analyzer installation program

To install the WAGS Analyzer, run the “WAGS_Ana.exe” program to de-compress the installation files. Start the “Setup.exe” program and follow the instructions.

The WAGS Analyzer needs the same PATH-statement in the “autoexec.bat” file as is necessary for the other tools of WAGS. If you have not included this statement yet, please follow the instruction provided in Section 3.1.

The WAGS Analyzer is a general-purpose tool to evaluate workflows in Lotus Notes™ databases. It can be used for the WAGS Tracking database, the WAGS Application Environment database or any other kind of Lotus Notes™ application.

In order to access regular Lotus Notes™ databases, assign the “\$UpdatedBy” field to the “Agent” field in the WAGS Analyzer. You are asked to do so after you have selected a database and a *view*.

If you experience that the WAGS Analyzer crashes when accessing Lotus Notes™ data directories, most probably there are files that are write-protected in this directory or one of its sub-directories. You have two options:

- Switch off the write-protection of the files. In Windows 95™, go to the “Windows Explorer”, select all relevant files and open the properties dialog (right mouse key). In the lower section of the properties dialog, you can switch off the write-protection.
- Unpack the file “Analyzer_update.zip” and replace the existing file “WAGSAnalyzer.exe” (in the directory you have specified during installation) with the new file. This will prevent the WAGS Analyzer from crashing, but still you can only access the respective Notes databases after switching off the write-protection.

4 Configuration of the Lotus Notes™ databases of WAGS

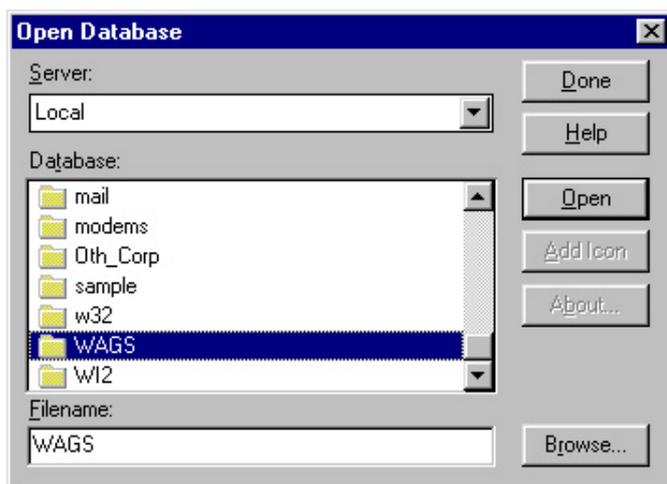
Since WAGS is a comparably large and complex application (like most workflow management systems are), it needs a detailed configuration in order to run properly.

4.1 Running WAGS on a Lotus Notes client

If you only want to see the fundamental features of WAGS, using it on a client only will suffice. This way, you can design workflow models with the WAGS Modeler, start workflow instances in the WAGS Engine and route workflow folders locally. You cannot see the more advanced WAWM features like sending *message objects* to other workflow management systems etc.

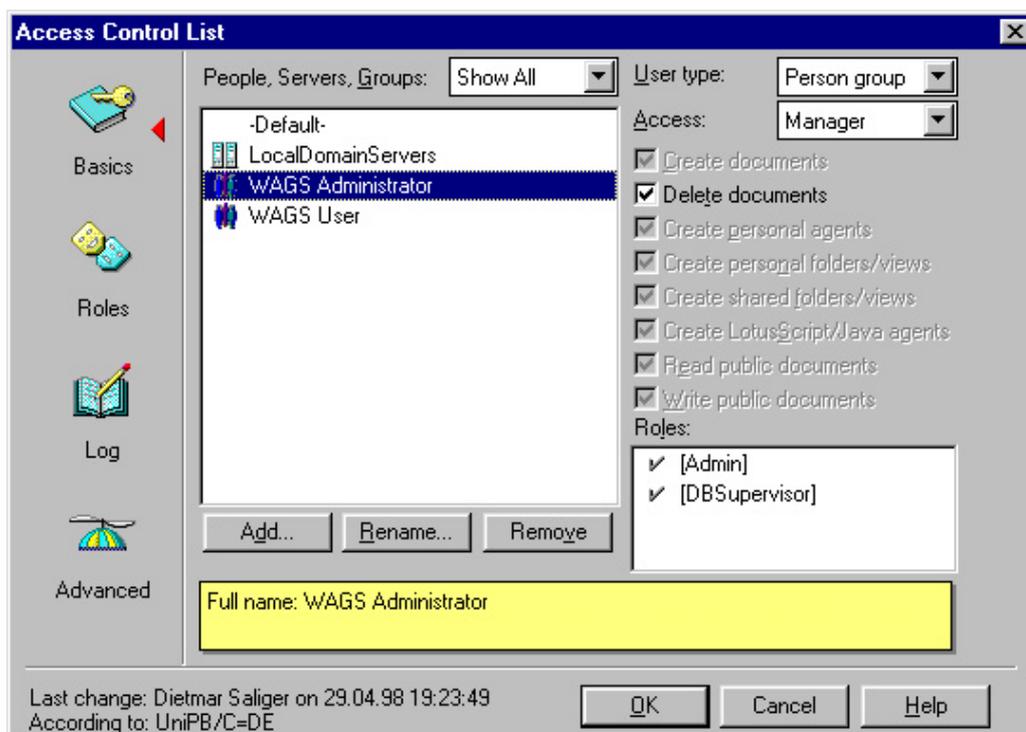
After you have installed WAGS using the *main installation program*, adapted the autoexec.bat file and re-started your PC, start your Lotus Notes client and do the following:

1. For the convenience of first-time users, the eight Lotus Notes™ databases are installed in a sub-directory (“WAGS databases”) of the program directory you indicated for installation (e.g. C:\program files\wags). This way, they can be directly accessed by the WAGS Modeler. In order to be run in the Lotus Notes environment, the eight databases have to be moved into the so-called Lotus Notes™ *data directory*. This is the directory where all of your Lotus Notes™ databases are located. You can create a sub-directory in the *data directory* (e.g. labeled “Wags”) and place the WAGS databases there, or you can directly move them in the top level of the *data directory*.
2. Add the eight Lotus Notes™ databases of WAGS to your Notes workspace. To do so, choose FILE-DATABASE-OPEN and, if necessary, go to the sub-directory you have created to store the databases (see the following screenshot).



Add all databases to your workspace using the “Add Icon” button. Close the dialog box.

- Click on the icon of the “WAGS Application environment” database and choose FILE-DATABASE-ACCESS CONTROL...
 You see the dialog to adjust the ACL (Access control list). Users of this database must have “author” rights to participate in workflows.
 The best way of granting these rights to all users concerned is to build a new group called “WAGS User” in the *Lotus Notes Name & Address* book of your server or domain. This group is already included in all databases of WAGS.
 Administrators should be included in the group “WAGS Administrator”. Persons or groups that own the role “[Admin]” can additionally see the “Administration” views. To see all documents in the database, make use of the role “[DBSupervisor]”.
 Please be aware that before placing databases on servers, the ACLs of all databases should be adjusted correctly. Servers have to be included in the ACL individually or can be added to the group “LocalDomainServers”. If you do not know how to adjust ACLs for servers, please do not use WAGS on a server since it will not work properly.



As long as you use WAGS only locally, you normally have “Manager” access to databases.

4. Open the database “WAGS Application environment”, press ESC to leave the “About” document and go to the view “Administration\1. Configuration”. There you find the “Global configuration” document. Open the document and check the different settings. The settings in this document must be correct in order to allow for a proper function of the WAGS Engine and all other components. The WAGS Engine identifies the different WAGS databases by their unique “replica ID”. Additionally, for the sending of *message objects* and *tracking messages*, WAGS needs different “mail-in addresses”. The mail-in addresses are relevant only if you use WAGS on a Lotus Domino™ server.
As long as you only use WAGS locally and do not make new copies of the database, the default settings should be correct.
If in any case, no such “Global configuration” document exists, create a new one using the “Global configuration” button. Make sure that only one document of this kind is present.
5. The WAGS Engine consists of several programs called agents in Lotus Notes™ terminology. When WAGS is used on a server, these agents run in the background in regular intervals. If you want to see the effects of routing directly on your client, you have to tell WAGS that you are working locally. To do so, go to the “Administration\1. Configuration” view in the WAGS Application Environment database and open the document “local” in the category “Server configuration”. Set the field “Run Agent ‘FinishTask’ immediately” to “Yes”.
If no such document exists, use the “Create Server Configuration” button and name the new document “Local”. Make sure that only one document of this kind exists.
6. Close the WAGS Application environment database.
Go to Chapter 5 to see how workflows are planned and executed with WAGS.

4.2 Running WAGS on a Lotus Domino server

To make use of the full functionality of WAGS, you need a Lotus Domino™ server. You should only do so if you are familiar with the configuration and administration of such a server. Therefore, the following explanations are written for people with the required fundamental knowledge.

1. Move the WAGS databases from the installation directory to the Lotus Notes™ data directory.
2. All users of WAGS have to be registered in the Notes N&A.
3. Users should be grouped according to the privileges they are supposed to have in the WAGS environment. Two groups, called “WAGS User” and “WAGS Administrator” are proposed by the author of this document. These groups have been included in the ACLs of all WAGS databases.
If you want to make use of own groups, they have to be added to the ACLs accordingly.
For the functionality of the roles “[Admin]” and “[DBSupervisor]”, see Section 4.1.
4. If you have installed the WAGS environment on a client computer, replicate the eight databases of WAGS to the respective server(s).
5. Register the following databases of WAGS as mail-in databases in your server’s or domain’s N&A:
WAGS Application environment
WAGS Gateway
WAGS Tracking
WAGS WebConnect
After registration of the mail-in databases in the N&A, shut down and re-start the server.
6. Make sure the correct mail-in names are included in the “Global configuration” document found in the WAGS Application Environment database in the view “Administration\1. Configuration”.
7. Provide the required settings in a “Server configuration” document in the same view for each server on which a replica of this WAGS Application Environment database resides. If you run WAGS on three Lotus Domino™ servers, you need 3 “Server configuration” documents.

8. Grant the right to run *unrestricted agents* to a person or group in the section “Agent Manager” of the server document (in the Notes N&A) of each server on which WAGS should run.
9. These persons or groups now need to go through the WAGS databases and adjust the agents to the respective servers. Be aware that server-based agents can only be saved on a person’s home server (the server where the person’s mail file is located).

You need a direct connection to the respective home server and the right to save unrestricted agents on this server.

Depending on the type of agent, it might suffice to activate the agent in the agent view → you can indicate the server on which the agent should run after clicking on the check box. All other agents have to be opened, the server has to be specified using the “Schedule” button and then the agent must be saved.

In the following databases, agents have to be adjusted to the respective server

WAGS Application environment:

- “FinishTask Server” → on schedule hourly
- “Incoming Mail” → if new mail has arrived
- “Reminding” → on schedule hourly

WAGS Tracking:

- “WAGS TRACKING Split Incoming Tracks” → if new mail has arrived
- “WAGS TRACKING Process Prepared Tracks” → on schedule hourly

WAGS WebConnect:

- “External WF Task” → if new mail has arrived

WAGS Gateway:

- “WAGS GATEWAY Incoming Mail” → if new mail has arrived

10. In order for WAGS to route workflow folders immediately (and not waiting until the background agent on the server has been executed), you have to provide the URL of the Lotus Domino server in the “Server Configuration” document in the WAGS Application Environment database and the respective setting in this document must be set to “Yes”.

Furthermore, the tasks “Web” and “HTTP” have to be started on the Domino server.

The agent “Finish Task Server” has to be renamed to “Finish Task + ‘Common Name of the server’ “, for example “Finish Task WagsCorp”.

This feature works fine with “clean” Lotus Domino servers. Nevertheless, servers that have been upgraded from older versions have caused system crashes in some cases. If you experience problems with immediate routing, switch it off in the “Server Configuration” document.

5 How to design wide area workflows with WAGS

This short description of the procedure describing the basic steps of designing and executing wide area workflows with WAGS cannot replace a fundamental understanding of workflow management systems and the concepts of Wide Area Workflow Management. This understanding can for example be achieved by reading the book mentioned in Chapter 1.

The following steps are necessary to plan and run *wide area workflows*:

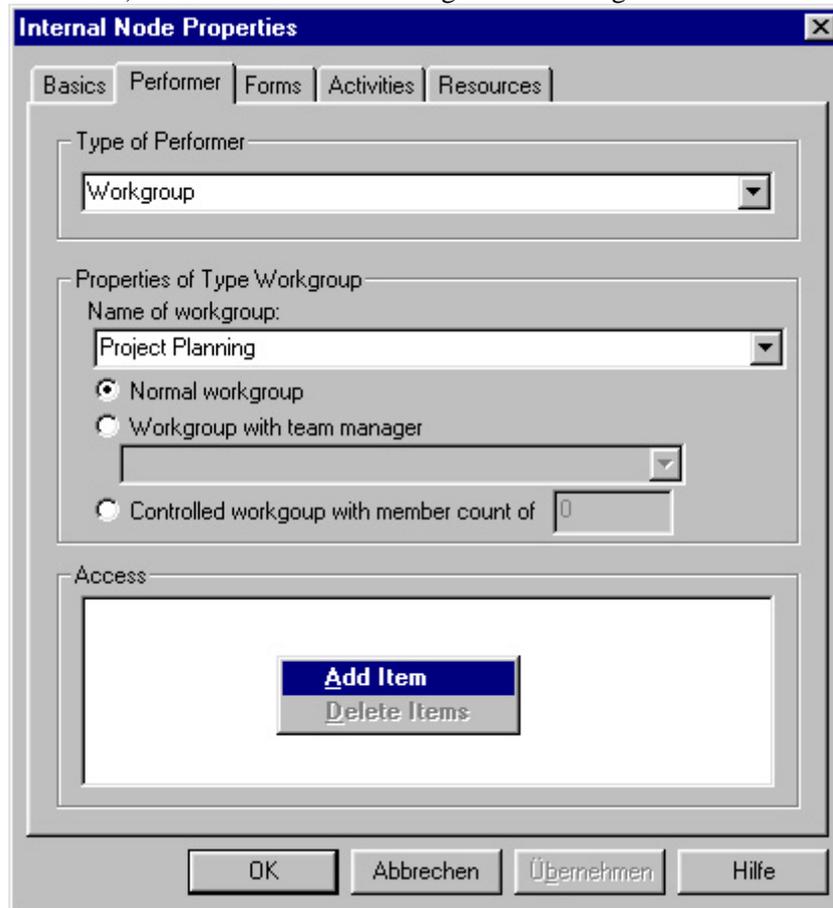
1. Register all internal performers in the WAGS Infrastructure database. Each user needs a *person* document indicating the full hierarchical name as used in the Notes-ID. Additionally, you can make use of *roles*, *workgroups* and *units* to make the design of workflows more flexible.
2. If you already have designed Lotus Notes documents (called *forms*), copy them from your existing applications to the WAGS Application Environment database. Open the forms in the design mode and add the “WAGS Header” *subform* at the beginning of the *form* and the “WAGS Footer” *subform* at the end. In order for WAGS to use forms, they must be named according to the

following syntax: “(GF ...)”, meaning that the name has to be included in brackets and has to start with “GF” and a space.

3. Open the WAGS Modeler.
4. Choose OPTIONS-SETTINGS. A dialog box appears where you can select the WAGS databases you want to work with. Check the correctness of the path of each database.
If the path statements are not correct, use the “Browse...” button to access the data directory of your Lotus Notes™ installation. If you want to use a regular file browser, click on the “Browse” button again.
You can select the six WAGS databases required by the Modeler all together. They are sorted-in correctly after you click the “OK” button.
5. Develop a workflow model using internal *nodes*, *arrows*, *internal clusters*, *external tasks*, *ordered subworkflows*, *external subscribed workflows* etc.
You can choose these elements from the “Workflow Tools” palette.
6. Each element has a properties dialog accessible via the context menu (right mouse key or double-click).

For example, to prepare an internal node for execution in a workflow you need to specify the name of the task, the performer(s) and one or more forms.

Please note that entries in empty lists are placed by using the right mouse key (see the following screenshot). This feature works throughout all dialog boxes of the WAGS Modeler.



In addition to the name of a task, the performers and forms, you can specify a list of activities to be worked through and assign resources (internal nodes). Other elements of the WAGS Modeler have other properties dialogs.

Please note that arrows have properties as well. They are used to specify *conditions* for routing that replace AND, OR or XOR elements.

7. Use the TOOLS-CONSISTENCY CHECK option to check workflow models for correctness.

8. Initially, new workflow models have the status “Design”. In order to assign the status “Active”, choose OPTIONS-WORKFLOW SETTINGS to display the dialog for workflow settings. Go through the different pages of the dialog to adjust all relevant settings.
9. As long as a workflow model has the status “Design”, it can be saved at any time. Previous versions are lost this way, so you might want to choose different names if you want to keep different versions of workflow models.

Once you have assigned the status “Active”, a consistency check is performed prior to the save operation. If the consistency check detects errors in the workflow model, it cannot be saved until the errors have been removed. Each saving of an “active” workflow model creates a new version, while previous versions are set to the status “Freeze”.

Only workflow models with the status “Active” can be used to instantiate workflow instances in the WAGS Application Environment database. If you update a workflow model after workflow instances have been started, these instances are completed based on the version of the process definitions that were “Active” at the time of instantiation.
10. During the design of workflow models, you might want to add additional forms, register new persons/roles/workgroups/units or design new interface specifications.

You can do so by switching to the Lotus Notes environment and creating the respective documents in the different databases of WAGS. To tell the WAGS Modeler that these changes should be made available to workflow designers, choose TOOLS-RELOAD REPOSITORY. Afterwards, all changes (and deletions!) are reflected in the different dialog boxes.
11. To see interface specifications of other workflows, which you want to connect to in order to create workflow models for *wide area workflows*, choose VIEW-EXTERNAL DIRECTORY. To see both windows of the process manager and the external directory manager besides each other, you might want to choose WINDOW-TILE.

For the functionality of the External Directory, see the book mentioned in Chapter 1.
12. Once you have completed the design of a workflow model, assigned the status “Active” and saved it, you can start workflow instances in the WAGS Application Environment database.

Please note that you can only start workflow instances from workflow models, where you have been assigned as performer in the first task. To achieve this, you have to be registered in the WAGS Infrastructure database with your hierarchical name (as used in your “Notes ID”) and have to be assigned as performer in the properties box of the first task in the workflow model.

To simplify this, you can create roles, workgroups or units containing multiple persons, and assign them to the first task.
13. To start a workflow instance, open the WAGS Application Environment database and go to the view “Personal view\1. By Status”. There you find a button “Start New Process”.

Prior to actually starting a workflow instance, a dialog box asks you to provide a name for the workflow and specify other details.

In this dialog box, you can select a workflow model as basis of your workflow instance.

After clicking OK, the form of the first workflow task is presented.
14. The WAGS Application Environment has a so-called “Action bar” at the top of the form, where you can choose from different buttons to handle workflow instances.
15. After you have completed the first workflow task, click on the “Next Task” button. The WAGS Engine will route the workflow folder to the next performer(s).

If you do not want to stay with the predefined workflow path, use the “Exceptions” button to change routing specifications.
16. Once you have completed your task and routed the workflow folder to the next performer(s), the workflow document is closed. You now see the your worklist, and if you own the role [Admin], you can also see the worklists of other users with the help of the “Administration” views.

This explanation only covers major steps. Feel free to try out other features of the WAGS Modeler and the WAGS Engine. Especially the WAWM-related features are very interesting, but their use can hardly be explained on a few pages.

It is recommendable to take a look at the ScreenMovies to get an impression of WAWM-related features – and to read the book mentioned in Chapter 1!

6 Troubleshooting

In the following paragraphs, some of the most common problems are described and possible solutions are proposed.

You are in the WAGS Application Environment and want to start a workflow instance, but an error message says that certain databases cannot be found:

- Check the “Global configuration” document in the WAGS Application Environment database (view “Administration\1. Configuration). If you do not see this view, you need to ask your administrator to grant the role “[Admin]” to you in the ACL of the database.
- Make sure that you have at least “Reader” access to the WAGS Infrastructure and WAGS Process Definition database.
- Check whether the WAGS databases are located in the Lotus Notes™ *data directory* (or a sub-directory within it).
- If you work locally, you need all of the WAGS databases locally, too. Likewise, all databases have to be stored on the server you want to work with.
Make sure that the databases are present on your workspace.

You are in the WAGS Application Environment and want to start a workflow instance, but you are told that you are not allowed to start workflow instances or you do not find the workflow model you are looking for in the list of workflow models:

- Check the “Global configuration” document in the WAGS Application Environment database (view “Administration\1. Configuration). If you do not see this view, you need to ask your administrator to grant the role “[Admin]” to you in the ACL of the database.
- Make sure that you have been registered in the WAGS Infrastructure database with your full hierarchical name.
- Make sure that you have been assigned as performer in the first task of the workflow model you want to use. This can be done by assigning you as *person* or member of a *role*, *workgroup* or *unit*.
- Check the WAGS Process Definitions database to see whether there are process definitions with the status “Active”.
- Check the *header document* of “active” process definitions to see whether the date of expiration has been passed.
- Process definitions are stored for certain WAGS Application Environment databases. This is indicated by a so-called “replica ID”, which is a unique number identifying a Notes database. Make sure that the replica ID of the process definition you want to start is identical with the one of the WAGS Application Environment database you want to use.

You cannot see the “Administration” views in the WAGS Application Environment:

- Make sure that you own the role “[Admin]” to you in the ACL of the database.

Immediate routing of workflow folders in a local WAGS Application Environment does not work:

- Is there a “Server configuration” document in the WAGS Application Environment database (view “Administration\1. Configuration), which is called “Local”?
If not, create such a document using the “New Server Configuration” button in the view.
- Check the settings in the “Server configuration” document called “Local” → the option "Run Agent 'FinishTask' immediately" has to be set to “Yes”.

- Is there an agent called “Finish Task” in the WAGS Application Environment database?
If not, re-install the WAGS Environment, but be sure to make a backup of your current installation first.

Immediate routing of workflow folders in a WAGS Application Environment on a server does not work:

- Is there a “Server configuration” document in the WAGS Application Environment database (view “Administration\1. Configuration), which is labeled with the full hierarchical name of the respective server?
If not, create such a document using the “New Server Configuration” button in the view.
- Does this “Server configuration” document contain a valid URL of the server?
- Make sure that the option "Run Agent 'FinishTask' immediately" is set to “Yes”.
- Make sure that there is an agent called “Finish Task + Common name of the server” in the WAGS Application Environment database. If your server is called “WAGSserver\Sales\WagsCorp\DE”, rename the “Finish Task” agent to “Finish Task WAGSserver”.
Check whether this agent has been set-up correctly and whether the person who has saved the agent has the right to execute *unrestricted agents* on the respective server.
- Make sure that the server-tasks “Web” and “HTTP” have been started and are working correctly.

Message Objects are not delivered correctly:

- Check in the Notes N&A whether all relevant databases have been registered correctly as mail-in databases.
- Check the e-mail addresses of the different WAGS databases in the “Global configuration” document in the WAGS Application Environment database (view “Administration\1. Configuration). The values provided here have to be identical with the mail-in addresses registered in the Notes N&A.
- Check whether the e-mail address of the WAGS Tracking database (e.g. mail-in address or foreign e-mail address) has been set correctly in the header document of the respective process definition in the WAGS Process Definition database.
- Please check whether you are really connected to the server you want to work with. Maybe you have chosen the wrong “location setup”, which can be selected on the right end of the status bar of the Lotus Notes client software.