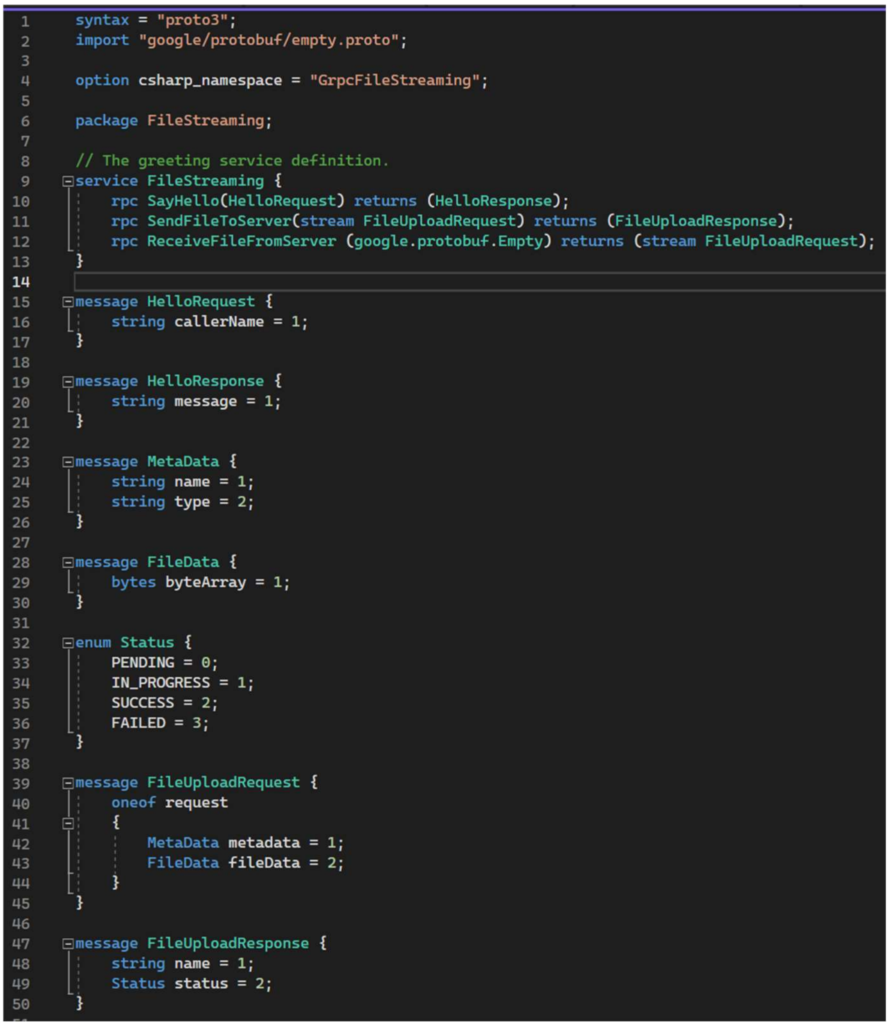
260389 Kamil Herbetko

243416 Jakub Szwedowicz

Raport z listy nr 3 RSI

17.04.2023 r.

1. Główne kroki projektowe serwera:
   1.1. Uruchom Visual Studio 2022
   1.2. Wybierz pozycję Utwórz nowy projekt.
   1.3. W oknie dialogowym Tworzenie nowego projektu wyszukaj ciąg gRPC. Wybierz pozycję ASP.NET Core usługi gRPC i wybierz przycisk Dalej.
   1.4. W oknie dialogowym Konfigurowanie nowego projektu wprowadź wartość GrpcFileStreaming w polu Nazwa projektu. Ważne jest, aby nazwać projekt GrpcFileStreaming , więc przestrzenie nazw są zgodne podczas kopiowania i wklejania kodu.
   1.5. Wybierz opcję Dalej.
   1.6. W oknie dialogowym Dodatkowe informacje wybierz pozycję .NET 6.0 (obsługa długoterminowa), a następnie wybierz pozycję Utwórz.
   1.7. Plik greet.proto w folderze Protos powinien wyglądać tak:



```
syntax = "proto3";
import "google/protobuf/empty.proto";

option csharp_namespace = "GrpcFileStreaming";

package FileStreaming;

// The greeting service definition.
service FileStreaming {
    rpc SayHello(HelloRequest) returns (HelloResponse);
    rpc SendFileToServer(stream FileUploadRequest) returns (FileUploadResponse);
    rpc ReceiveFileFromServer (google.protobuf.Empty) returns (stream FileUploadRequest);
}

message HelloRequest {
    string callerName = 1;
}

message HelloResponse {
    string message = 1;
}

message MetaData {
    string name = 1;
    string type = 2;
}

message FileData {
    bytes byteArray = 1;
}

enum Status {
    PENDING = 0;
    IN_PROGRESS = 1;
    SUCCESS = 2;
    FAILED = 3;
}

message FileUploadRequest {
    oneof request
    {
        MetaData metadata = 1;
        FileData fileData = 2;
    }
}

message FileUploadResponse {
    string name = 1;
    Status status = 2;
}
```

   1.8. Uruchom serwer (Ctrl + F5)
2. Główne kroki projektowe:
   2.1. Otwórz drugie wystąpienie programu Visual Studio i wybierz pozycję Utwórz nowy projekt.
   2.2. W oknie dialogowym Tworzenie nowego projektu wybierz pozycję Aplikacja konsolowa, a następnie wybierz przycisk Dalej.
   2.3. W polu tekstowym Nazwa projektu wprowadź GrpcFileStreamingClient i wybierz przycisk Dalej.

2.4. W oknie dialogowym Dodatkowe informacje wybierz pozycję .NET 6.0 (obsługa długoterminowa), a następnie wybierz pozycję Utwórz.

2.5. Zainstaluj następujące pakiety:

  2.5.1. Grpc.Net.Client, który zawiera klienta platformy .NET Core.

  2.5.2. Google.Protobuf, który zawiera interfejsy API komunikatów protobuf dla języka C#.

  2.5.3. Grpc.Tools, które zawierają obsługę narzędzi języka C# dla plików protobuf. Pakiet narzędzi nie jest wymagany w czasie wykonywania, więc zależność jest oznaczona za pomocą PrivateAssets="All"polecenia .

2.6. W programie Visual Studio wybierz pozycję Narzędzia>Menedżer pakietów NuGetKonsola menedżera pakietów>

2.7. W oknie Konsola menedżera pakietów uruchom polecenie cd GrpcFileStreamingClient , aby zmienić katalogi na folder zawierający GrpcFileStreamingClient.csproj pliki.

2.8. Uruchom następujące polecenia:

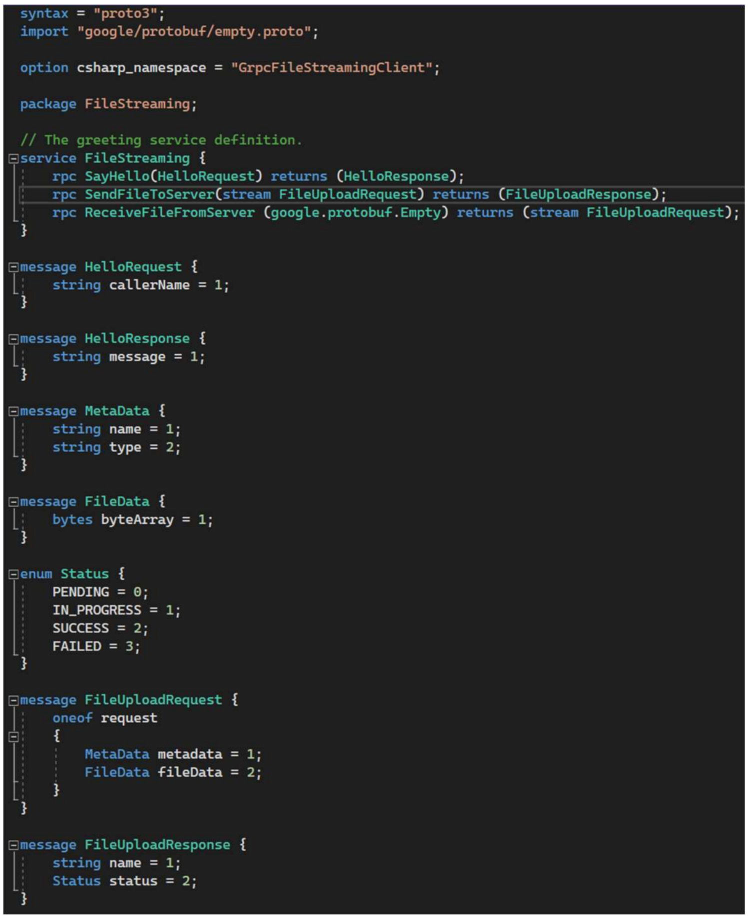
  2.8.1. Install-Package Grpc.Net.Client

  2.8.2. Install-Package Google.Protobuf

  2.8.3. Install-Package Grpc.Tools

2.9. Utwórz folder Protos w projekcie klienta gRPC.

2.10. Utwórz plik greet.proto z następującą zawartością:

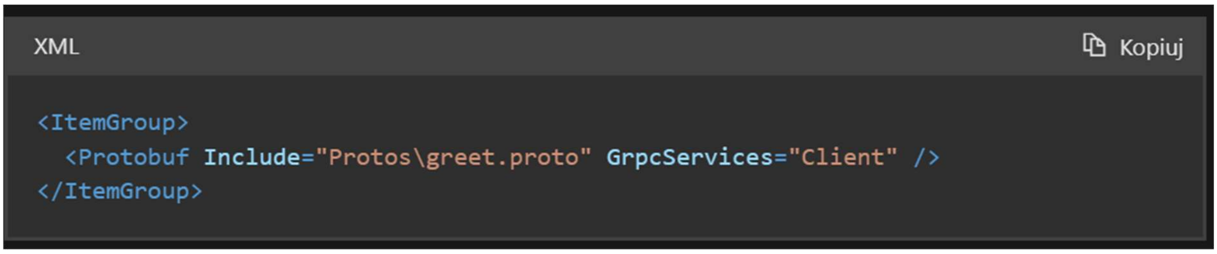


```
syntax = "proto3";
import "google/protobuf/empty.proto";

option csharp_namespace = "GrpcFileStreamingClient";

package FileStreaming;

// The greeting service definition.
service FileStreaming {
    rpc SayHello(HelloRequest) returns (HelloResponse);
    rpc SendFileToServer(stream FileUploadRequest) returns (FileUploadResponse);
    rpc ReceiveFileFromServer (google.protobuf.Empty) returns (stream FileUploadRequest);
}

message HelloRequest {
    string callerName = 1;
}

message HelloResponse {
    string message = 1;
}

message MetaData {
    string name = 1;
    string type = 2;
}

message FileData {
    bytes byteArray = 1;
}

enum Status {
    PENDING = 0;
    IN_PROGRESS = 1;
    SUCCESS = 2;
    FAILED = 3;
}

message FileUploadRequest {
    oneof request
    {
        MetaData metadata = 1;
        FileData fileData = 2;
    }
}

message FileUploadResponse {
    string name = 1;
    Status status = 2;
}
```

2.11. GrpcFileStreamingClient.csproj Edytuj plik projektu.

2.12. Kliknij prawym przyciskiem myszy projekt i wybierz polecenie Edytuj plik projektu.

2.13. Dodaj grupę elementów z elementem odwołującym <Protobuf> się do pliku greet.proto :



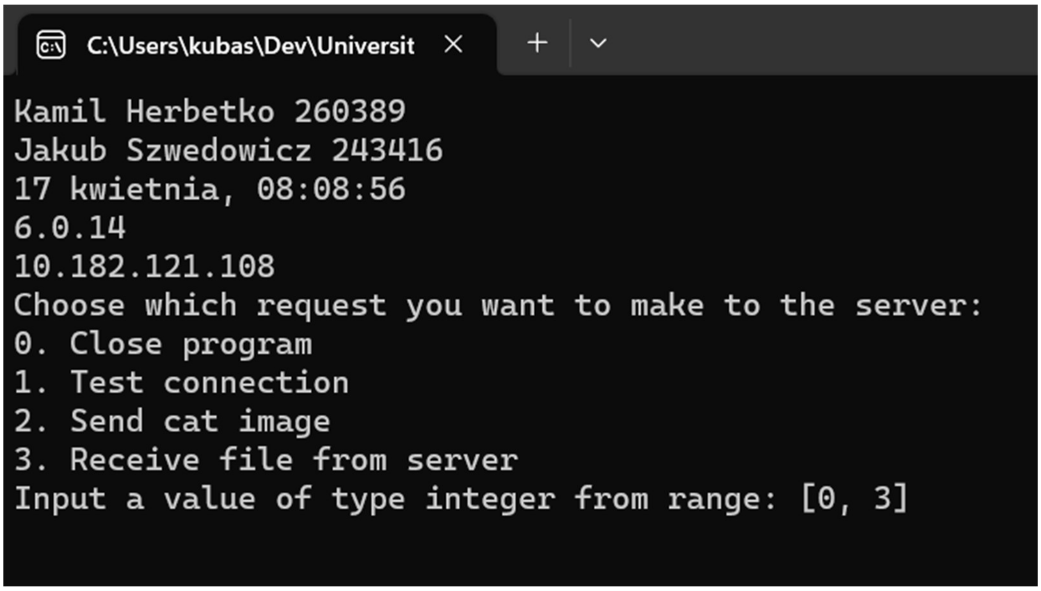
```xml
<ItemGroup>
  <Protobuf Include="Protos\greet.proto" GrpcServices="Client" />
</ItemGroup>
```

2.14. Skompiluj klienta.

2.15. Uruchom klienta (Ctrl + F5)

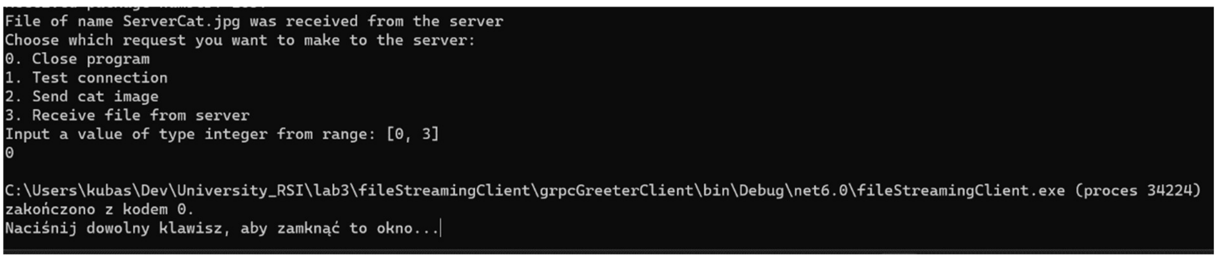
3. Działanie programu
   3.1. Klient wysyła plik na serwer za pomocą metody „SendFileToServer”. Otwierany jest strumień „FileUploadRequest”, w którym w pierwszej wiadomości przesyłane są metadane za pomocą struktury „MetaData”. Następnie przesyłane są paczki 1024 bajtów (lub 2048 dla drugiej wersji ćwiczenia). Serwer po zakończeniu odbierania pliku odsyła response „FileUploadResponse”, w którym są nazwa otrzymanego pliku oraz status z jakim zakończono przesyłanie.
   3.2. Klient chcąc odebrać plik z serwera musi zainicjować połączenie. Wysyła zatem request z placeholderem „Empty” i w responsie otrzymuje strumień „FIleUploadRequest”. Następnie serwer za jego pomocą przesyła plik. Klient po zakończeniu transferu nie odsyła żadnego responsa.
   3.3. Przy zmiane wielkości rozmiaru paczki z 1024B na 2048B liczba przesłanych pakietów zmniejszyła się dwukrotnie.
4. Screenshoty
   Konfiguracja dwumaszynowa:

Menu clienta:



```
Kamil Herbetko 260389
Jakub Szwedowicz 243416
17 kwietnia, 08:08:56
6.0.14
10.182.121.108
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
```

Zamknięcie klienta:

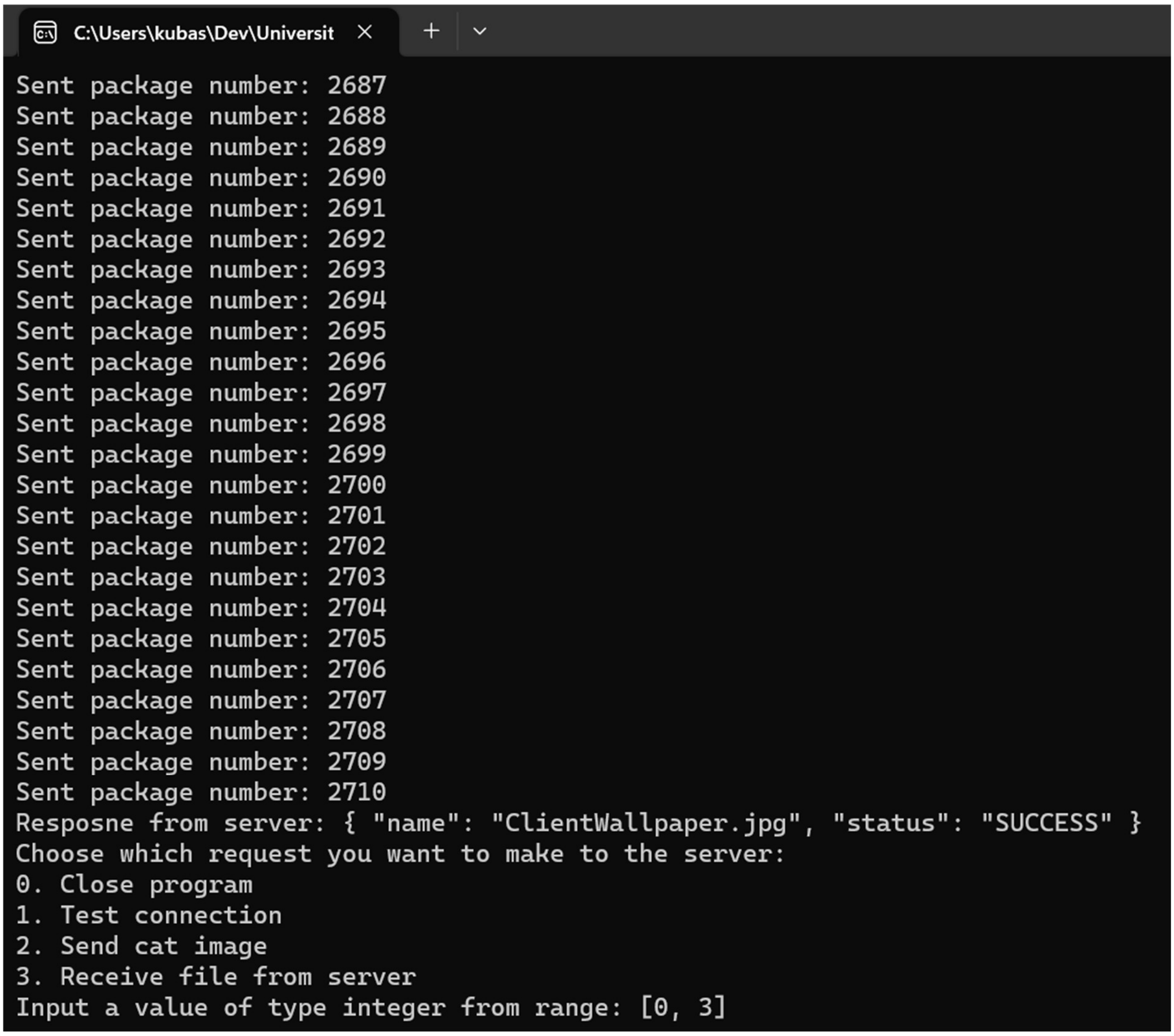


```
File of name ServerCat.jpg was received from the server
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
0

C:\Users\kubas\Dev\University_RSI\lab3\fileStreamingClient\grpcGreeterClient\bin\Debug\net6.0\fileStreamingClient.exe (proces 34224)
zakończono z kodem 0.
Naciśnij dowolny klawisz, aby zamknąć to okno...
```

1024 B:

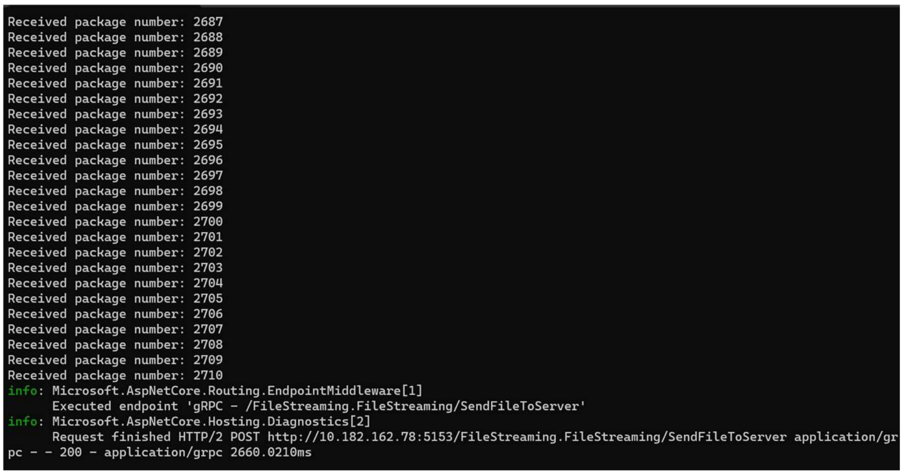
Wysyłanie:

Request:



```
Sent package number: 2687
Sent package number: 2688
Sent package number: 2689
Sent package number: 2690
Sent package number: 2691
Sent package number: 2692
Sent package number: 2693
Sent package number: 2694
Sent package number: 2695
Sent package number: 2696
Sent package number: 2697
Sent package number: 2698
Sent package number: 2699
Sent package number: 2700
Sent package number: 2701
Sent package number: 2702
Sent package number: 2703
Sent package number: 2704
Sent package number: 2705
Sent package number: 2706
Sent package number: 2707
Sent package number: 2708
Sent package number: 2709
Sent package number: 2710
Resposne from server: { "name": "ClientWallpaper.jpg", "status": "SUCCESS" }
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
```

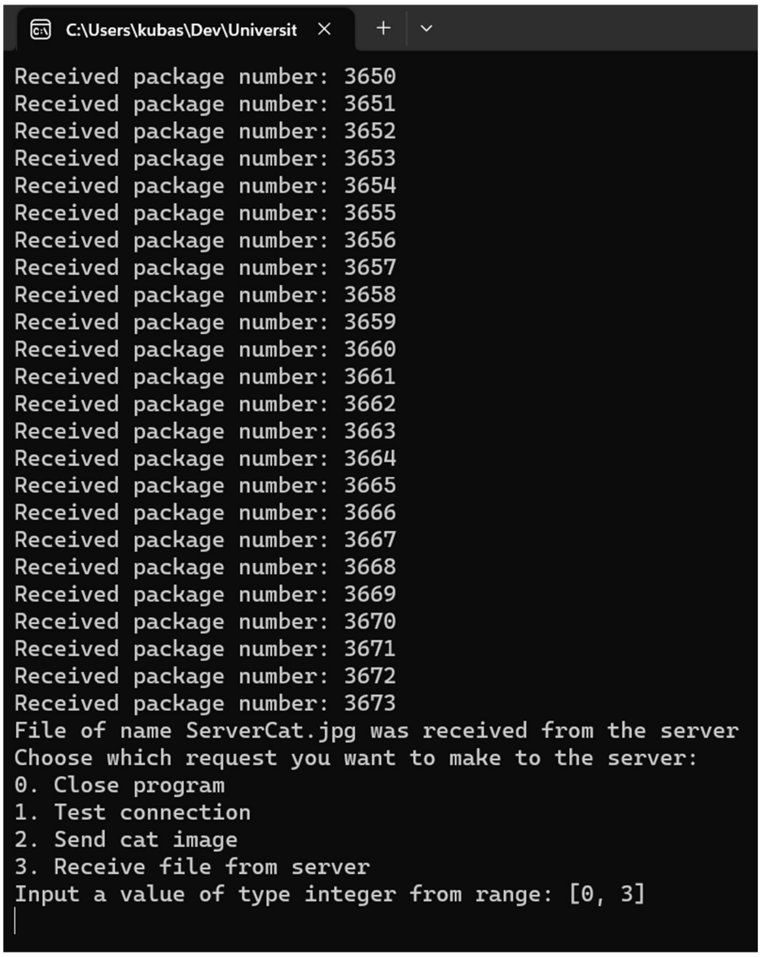
Response:



```
Received package number: 2687
Received package number: 2688
Received package number: 2689
Received package number: 2690
Received package number: 2691
Received package number: 2692
Received package number: 2693
Received package number: 2694
Received package number: 2695
Received package number: 2696
Received package number: 2697
Received package number: 2698
Received package number: 2699
Received package number: 2700
Received package number: 2701
Received package number: 2702
Received package number: 2703
Received package number: 2704
Received package number: 2705
Received package number: 2706
Received package number: 2707
Received package number: 2708
Received package number: 2709
Received package number: 2710
info: Microsoft.AspNetCore.Routing.EndpointMiddleware[1]
      Executed endpoint 'gRPC - /FileStreaming.FileStreaming/SendFileToServer'
info: Microsoft.AspNetCore.Hosting.Diagnostics[2]
      Request finished HTTP/2 POST http://10.182.162.78:5153/FileStreaming.FileStreaming/SendFileToServer application/gr
pc - - 200 - application/grpc 2660.0210ms
```

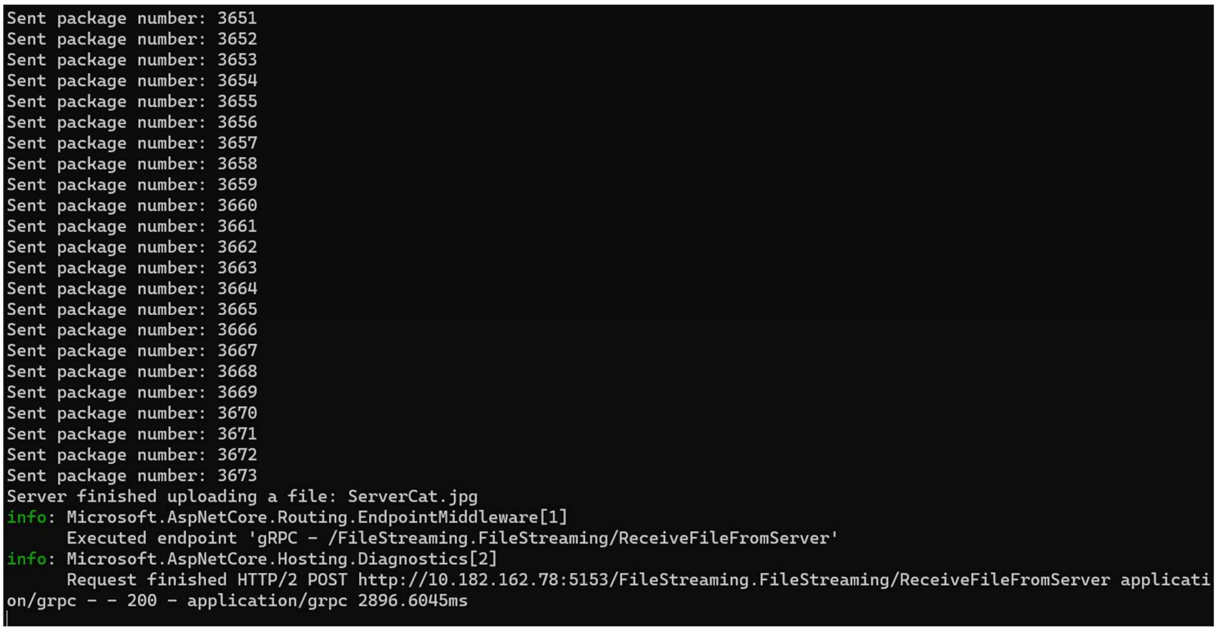
Pobieranie:

Request:



```
Received package number: 3650
Received package number: 3651
Received package number: 3652
Received package number: 3653
Received package number: 3654
Received package number: 3655
Received package number: 3656
Received package number: 3657
Received package number: 3658
Received package number: 3659
Received package number: 3660
Received package number: 3661
Received package number: 3662
Received package number: 3663
Received package number: 3664
Received package number: 3665
Received package number: 3666
Received package number: 3667
Received package number: 3668
Received package number: 3669
Received package number: 3670
Received package number: 3671
Received package number: 3672
Received package number: 3673
File of name ServerCat.jpg was received from the server
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
```

Response:

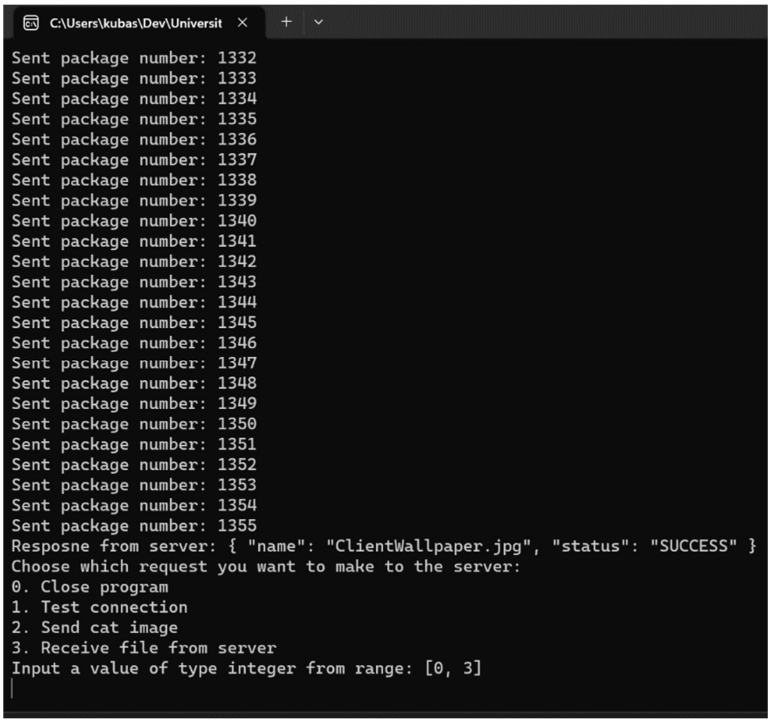


```
Sent package number: 3651
Sent package number: 3652
Sent package number: 3653
Sent package number: 3654
Sent package number: 3655
Sent package number: 3656
Sent package number: 3657
Sent package number: 3658
Sent package number: 3659
Sent package number: 3660
Sent package number: 3661
Sent package number: 3662
Sent package number: 3663
Sent package number: 3664
Sent package number: 3665
Sent package number: 3666
Sent package number: 3667
Sent package number: 3668
Sent package number: 3669
Sent package number: 3670
Sent package number: 3671
Sent package number: 3672
Sent package number: 3673
Server finished uploading a file: ServerCat.jpg
info: Microsoft.AspNetCore.Routing.EndpointMiddleware[1]
      Executed endpoint 'gRPC - /FileStreaming.FileStreaming/ReceiveFileFromServer'
info: Microsoft.AspNetCore.Hosting.Diagnostics[2]
      Request finished HTTP/2 POST http://10.182.162.78:5153/FileStreaming.FileStreaming/ReceiveFileFromServer applicati
on/grpc - - 200 - application/grpc 2896.6045ms
```

2048 B:

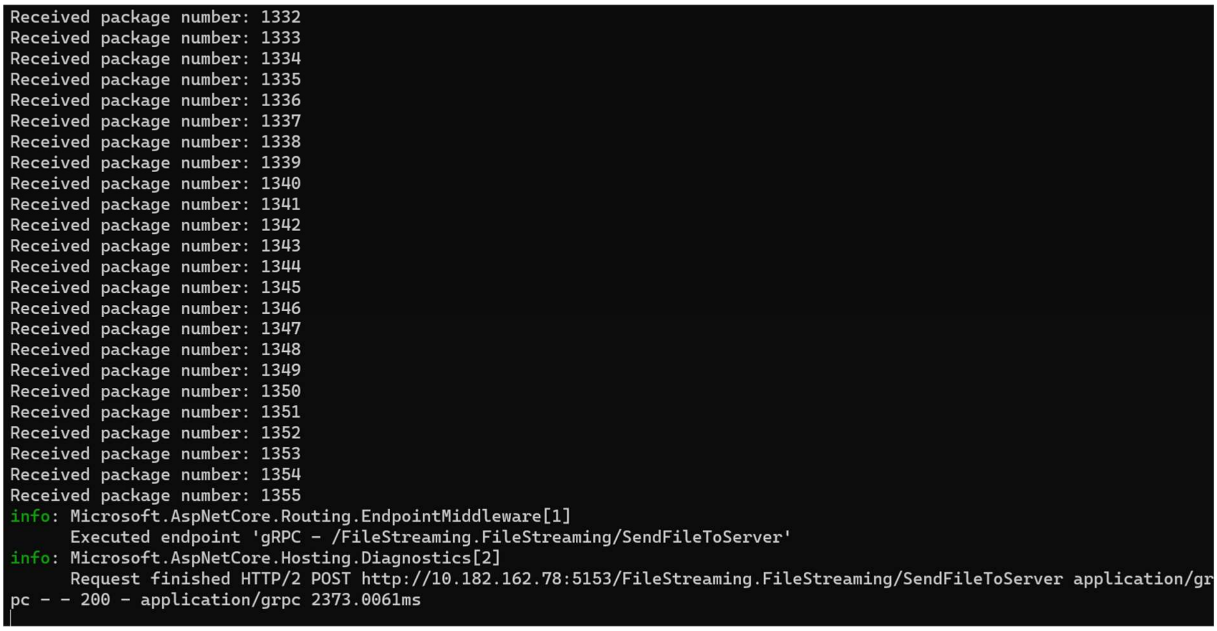
Wysyłanie:

Request:



```
Sent package number: 1332
Sent package number: 1333
Sent package number: 1334
Sent package number: 1335
Sent package number: 1336
Sent package number: 1337
Sent package number: 1338
Sent package number: 1339
Sent package number: 1340
Sent package number: 1341
Sent package number: 1342
Sent package number: 1343
Sent package number: 1344
Sent package number: 1345
Sent package number: 1346
Sent package number: 1347
Sent package number: 1348
Sent package number: 1349
Sent package number: 1350
Sent package number: 1351
Sent package number: 1352
Sent package number: 1353
Sent package number: 1354
Sent package number: 1355
Resposne from server: { "name": "ClientWallpaper.jpg", "status": "SUCCESS" }
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
```

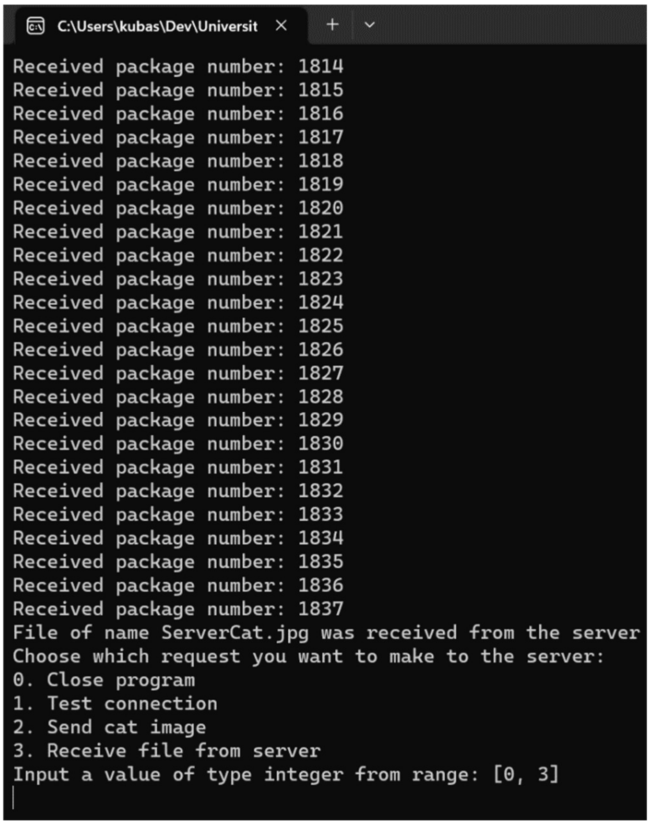
Response:



```
Received package number: 1332
Received package number: 1333
Received package number: 1334
Received package number: 1335
Received package number: 1336
Received package number: 1337
Received package number: 1338
Received package number: 1339
Received package number: 1340
Received package number: 1341
Received package number: 1342
Received package number: 1343
Received package number: 1344
Received package number: 1345
Received package number: 1346
Received package number: 1347
Received package number: 1348
Received package number: 1349
Received package number: 1350
Received package number: 1351
Received package number: 1352
Received package number: 1353
Received package number: 1354
Received package number: 1355
info: Microsoft.AspNetCore.Routing.EndpointMiddleware[1]
      Executed endpoint 'gRPC - /FileStreaming.FileStreaming/SendFileToServer'
info: Microsoft.AspNetCore.Hosting.Diagnostics[2]
      Request finished HTTP/2 POST http://10.182.162.78:5153/FileStreaming.FileStreaming/SendFileToServer application/gr
pc - - 200 - application/grpc 2373.0061ms
```

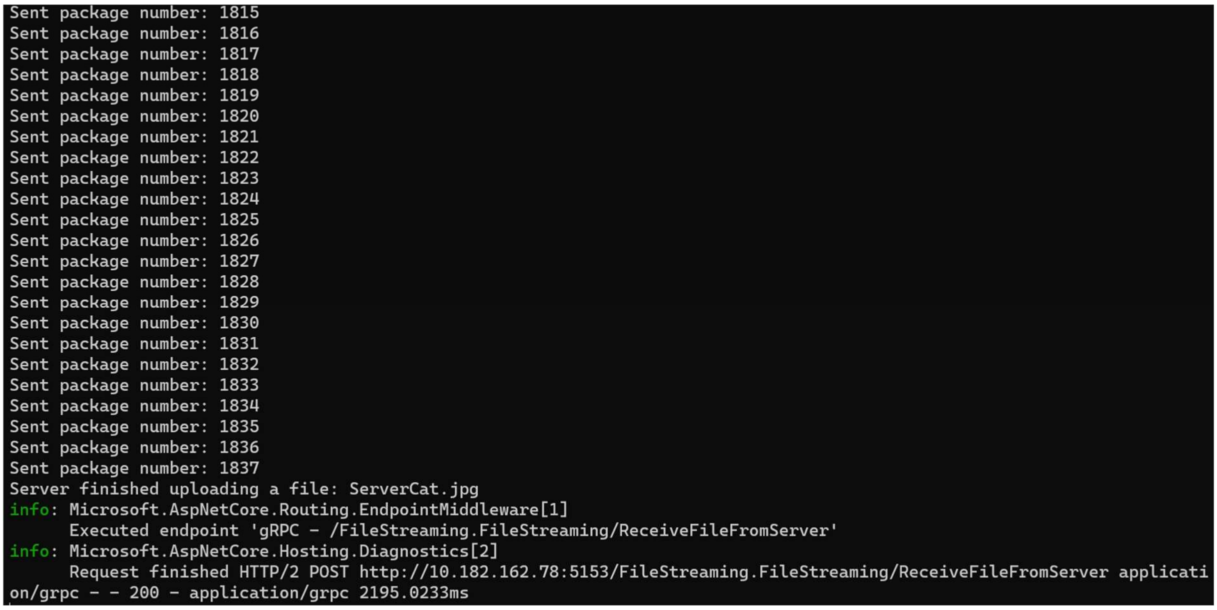
Pobieranie:

Request:



```
Received package number: 1814
Received package number: 1815
Received package number: 1816
Received package number: 1817
Received package number: 1818
Received package number: 1819
Received package number: 1820
Received package number: 1821
Received package number: 1822
Received package number: 1823
Received package number: 1824
Received package number: 1825
Received package number: 1826
Received package number: 1827
Received package number: 1828
Received package number: 1829
Received package number: 1830
Received package number: 1831
Received package number: 1832
Received package number: 1833
Received package number: 1834
Received package number: 1835
Received package number: 1836
Received package number: 1837
File of name ServerCat.jpg was received from the server
Choose which request you want to make to the server:
0. Close program
1. Test connection
2. Send cat image
3. Receive file from server
Input a value of type integer from range: [0, 3]
```

Response:



```
Sent package number: 1815
Sent package number: 1816
Sent package number: 1817
Sent package number: 1818
Sent package number: 1819
Sent package number: 1820
Sent package number: 1821
Sent package number: 1822
Sent package number: 1823
Sent package number: 1824
Sent package number: 1825
Sent package number: 1826
Sent package number: 1827
Sent package number: 1828
Sent package number: 1829
Sent package number: 1830
Sent package number: 1831
Sent package number: 1832
Sent package number: 1833
Sent package number: 1834
Sent package number: 1835
Sent package number: 1836
Sent package number: 1837
Server finished uploading a file: ServerCat.jpg
info: Microsoft.AspNetCore.Routing.EndpointMiddleware[1]
      Executed endpoint 'gRPC - /FileStreaming.FileStreaming/ReceiveFileFromServer'
info: Microsoft.AspNetCore.Hosting.Diagnostics[2]
      Request finished HTTP/2 POST http://10.182.162.78:5153/FileStreaming.FileStreaming/ReceiveFileFromServer applicati
on/grpc - - 200 - application/grpc 2195.0233ms
```